OPHTHALMIC JURISPRUDENCE

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OPHTHALMIC JURISPRUDENCE

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The American Encyclopedia of Ophthalmology

Where the Title is "Legal Relations of Ophthalmology"

BY

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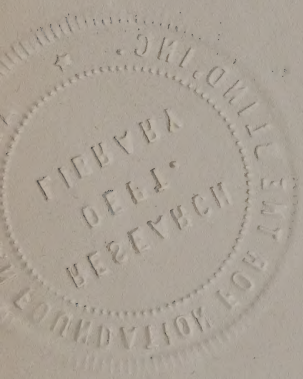
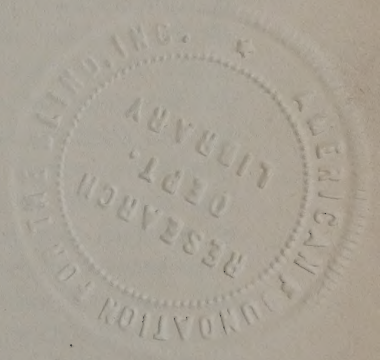
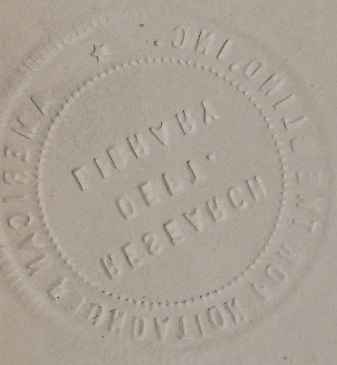


TO
HIS WIFE

Fannie English Shastid

BUT FOR WHOSE PATIENT FORBEARANCE,
KIND ENCOURAGEMENT, AND CONTINU-
AL MINISTRATIONS THROUGH HIS MANY
YEARS OF ILLNESS, THE MOST OF HIS WORK
COULD NOT HAVE BEEN PERFORMED,
THE AUTHOR GRATEFULLY
DEDICATES THIS
VOLUME





INTRODUCTION

The author of this volume is well qualified by study and experience to discuss the legal relations of ophthalmology. He made an excellent record as a student of law at the University of Michigan, where I was one of his teachers, and where he received his bachelor's degree in law in 1902. Before taking up the study of law he had been a practicing physician for several years, having received his first degree in medicine in 1888 and having continued his medical studies during the following year at the University of Vienna, where he specialized in ophthalmology.

To those who had observed his enthusiastic diligence as a law student it seemed a grave misfortune that he was obliged, because of an injury to his throat, to abandon his project of practicing law. He continued, however, the practice of medicine, and, fortunately, taste and ability for literary work have enabled him to render valuable service to his two professions through his writings on medico-legal subjects.

This essay is a reprint of an article which appears in Volume IX of *"The American Encyclopedia and Dictionary of Ophthalmology."* The first part of this great work appeared in 1913, and the volumes thus far issued (it is not quite completed) afford remarkable evidence of the importance of the science of ophthalmology. The neglect with which, before the writings of Doctor Shastid, the medical jurisprudence of this important subject had been treated is sufficiently apparent from the fact that such a standard work as that, for example, of Taylor, practically ignores it, while even the monumental production of Witthaus and Becker (latest edition) in its section entitled "Vision and Audition in their Medico-Legal Relations" is devoted (so far as the eye is concerned) simply to sight-testing, simulated blindness, and ocular injuries. The far greater thoroughness, especially on the legal side, with which Doctor Shastid has developed his subject (for it may well be called his) is obvious at a glance.

The following pages abound in valuable advice and suggestion for both the physician and the lawyer.

The author's comparative view of ophthalmo-sanitary legislation in the United States and four leading European countries ought to stimu-

late members of both professions to work for an improvement in American sanitary statutes.

The lawyer who has occasion to consider the medico-legal aspect of injuries to the eye will be especially grateful for the chapter on ophthalmic expert testimony.

While the last quarter of the book is devoted to a discussion of ophthalmo-surgical malpractice, there will be found in it much besides a consideration of this special subject: it may be that the lawyer who has read this chapter will be more cautious than he otherwise would have been in representing a client claiming damages from a physician for malpractice.

In its original form as an article in the Encyclopedia this work is almost inaccessible to lawyers, and its reproduction in this separate volume will be appreciated by those of the legal profession who are fortunate enough to obtain a copy.

JAMES H. BREWSTER.

Denver, Colorado,
October, 1916.

OPHTHALMIC JURISPRUDENCE [1]

Inasmuch as the subject of ophthalmic jurisprudence is very comprehensive and also somewhat intricate, the following outline of the contents of this article is offered in the hope that it may serve as a guide through the ophthalmo-jurisprudential labyrinth.

I. INTRODUCTION: Court Systems and Basic Legal Principles in America, England, France, Germany, and Italy.

II. OPHTHALMIC EXPERT TESTIMONY.

- A. Legal Considerations in America, England, France, Germany, and Italy.
- B. Medical and Surgical Considerations.
  - Commonest Injuries with which the Ophthalmic Expert has to Deal.
  - Simulation of Ocular Injury or Disease.
  - False Attribution of Ocular Injury or Disease.
  - Exaggeration.
  - Dissimulation.
  - Visual Economics.
  - Questions of a General Nature Relating to the Power of Vision.
  - Condition of the Eye after Death.
  - Ocular Signs of Sleep.
  - Ocular Indications of Poisoning, Burning, etc.
  - Ocular Signs of Identity.

III. OPHTHALMO-SANITARY LEGISLATION IN THE FIVE COUNTRIES: Ophthalmia Neonatorum, Optometry, School Inspection, Vaccination, etc.[2]

IV. MALPRACTICE.

- A. Legal Considerations in America, England, France, Germany, and Italy.
- B. Medical and Surgical Considerations.

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[1] So far as the Editor knows, Dr. Shastid's chapter in Wood's *"System of Ophthalmic Operations"* (Chicago, 1911), which appeared beneath the caption, "The Forensic Relations of Ophthalmic Surgery," and which forms the basis of the present article, was the earliest attempt in any language to render a systematic account of the law relating to our special subject. The Editor does not, of course, ignore the numerous, and now and then important, monographs which had dealt with the various minor aspects of ophthalmic jurisprudence. The chapter in question, considerably epitomized and brought to date, appeared in Ball's *"Modern Ophthalmology"* (Phila., 1913) and was there entitled "The Legal Relations of Ophthalmology." The present article also bears that title, but the matter has been again revised as well as very much enlarged.—Ed.

[2] The ophthalmo-sanitary heads are all considered in this article chiefly as a means of preserving this (the major) article's continuity, and, therefore, in each instance are given as a kind of abstract. For a fuller consideration, in each case, see **Conservation of vision**; as well as **Care of the eyes.**

OPHTHALMIC JURISPRUDENCE

I.

Introduction: Court systems and basic legal principles in America, England, France, Germany, and Italy.

In order to comprehend the laws relating to medical experts, the laws on which the science of visual economics and the like depends, and especially the laws relating to medical and surgical malpractice, either in this or in any other land, it is first of all essential to comprehend the system of courts in the countries whose laws are under consideration, and also certain fundamental legal principles, without a knowledge of which no individual laws whatever can be really understood. Nor is this task so formidable as it might at first appear. Comparative jurisprudence, though a realm of almost infinite extent,[1] nevertheless exhibits for its prominent characteristics certain very simple matters, which can easily be stated and easily be understood. And only these featural affairs, these salient characteristics, will here be attempted.

Court Systems and Basic Legal Principles in the United States.

To take our own country first, because it is the nearest and because its judicial system, though the most difficult, is already partly known to us. In the United States two entirely distinct judicial systems are daily operating, as it were side by side—the federal and the state. The federal courts exist by the authority of the federal constitution—the constitution of the United States of America—and the state courts by the authority of the constitutions of the various separate states—Texas, New York, Illinois, etc. The federal courts interpret, apply, and enforce the constitution of the United States, the statutes which have been passed by Congress, and, under many circumstances, the constitutions and statutes of the several states. They do not, however, as a rule, enforce any former judicial decisions either of themselves or of the state courts. There is, in other words, no federal "common law."[2] State courts, on the other hand, interpret, apply, and enforce their own constitutions, the statutes of their own legislatures,

[1] So vast, in fact, is the field of comparative law, that only a little (to speak relatively) has ever been done to develop it.

[2] For example, in the case of Wheaton v. Peters (8 Peters 591, 1831), the Court declared: "It is clear there can be no common law of the United States. The Federal Government is composed of states; each of which may have its local usages, customs, and common law. There is no principle which pervades the Union and has the authority of law; that is not embodied in the constitution or laws of the Union. The common law could be made a part of our federal system, only by legislative adoption." Even in matters of procedure there is no federal case law. Thus Dwyer, "*Law and Procedure of U. S. Courts,*" p. 320: "In *law* cases, the Federal courts follow the *procedure* of the states; but in *equity*, the old chancery procedure is followed except where Congress has modified or changed the old rules."

and the various judicial decisions which have been rendered in former cases by themselves.

Now, exactly what courts are those which go to constitute the so-called "federal" system, and what, in the case of each, is its jurisdiction? The federal courts consist (excluding certain tribunals whose existence is here irrelevant even for purposes of clearness, such as the interstate commerce commission, the consular courts, etc.) first, of the district courts,[1] then of the circuit court of appeals, and, finally, of the Supreme Court of the United States.

The federal *district courts* have original jurisdiction only, excepting appellate jurisdiction (i. e., from the judgments and orders of United States commissioners) under Chinese-exclusion laws and over the Yellowstone National Park. Their authority extends (as well as to many other matters here irrelevant) to "all cases of admiralty and maritime jurisdiction," to "all crimes and offenses cognizable under the authority of the United States," to "all cases arising under the postal laws," and to "all suits brought by any person to recover damages for any injury to his person . . . or property on account of any act done by him, under any law of the United States, for the protection or collection of any of the revenues thereof." In all of these matters, as will be readily observed, the assistance of the medical expert witness is frequently required for the untying of lego-medical knots. Then again, the federal district courts have jurisdiction over "all suits of a civil nature, at common law or in equity, brought by the United States, or any other officer thereof authorized by law to sue, or between citizens of the same State claiming lands under grants from different states; *or, where the matter in controversy exceeds, exclusive of interest and costs, the sum or value of three thousand dollars,* and (a) arises under the Constitution or laws of the United States, or treaties made, or which shall be made, under their authority, *or* (b) *is between citizens of different States, or* (c) *is between citizens of a State and foreign States, citizens, or subjects.*" The specially relevant passages have been italicized by the present writer, and it is easy to perceive from these passages that, in suits of a civil nature for personal injuries, where the matter in controversy exceeds, exclusive of interests and costs, the sum or value of three thousand dollars, and

[1] It may not be amiss to suggest that there are several federal district courts (no district, by the way, transgressing a state boundary) in almost every state. The United States circuit courts, which had been in existence for more than a hundred and twenty years, were abolished by "The Judicial Code" of Mar. 3, 1911, and all of their jurisdiction, as well as their "pending labors," was transferred to the federal district courts, which, in addition, kept all the jurisdiction which they had had before the passage of that Code.—See 226 U. S. 420.

where such suit is between citizens of different States, or between citizens of a State and foreign States, citizens and subjects, a physician may be required to appear either in his quality of expert witness or in that of defendant in a malpractice suit. It is specially to be noted that a physician cannot be sued for malpractice in a United States court (contrary, of course, in a State court) unless the requirement of diverse citizenship between his plaintiff and himself shall truly exist and appear in the pleadings, and also unless the amount that is sued for shall, exclusive of interest and costs, exceed the sum or value of three thousand dollars.

The *circuit court of appeals* has appellate jurisdiction only. Physicians, therefore, have no occasion to appear before this court.

The jurisdiction of the *Supreme Court* of the United States is thus expressed by the federal constitution:[1] "In all cases affecting ambassadors, other public ministers and consuls, and those in which a state shall be a party, the Supreme Court shall have original jurisdiction, and in all other cases . . . appellate jurisdiction . . ." So far as this court possesses original jurisdiction, it may, of course, require the attendance of expert (as well as of ordinary) witnesses.

Thus much for the federal system of courts; now for the systems, or sets, of courts which exist in the separate states and which operate by virtue of the authority conferred upon them by the various state constitutions. These state systems differ a little in the different states, but in the state of Illinois for example, they are, briefly: the coroners' courts, the courts of justices of the peace, the county courts, the circuit courts, the appellate courts, the city courts (simply auxiliary circuit courts) and the Supreme Court.[2]

As defendant in a malpractice suit, the physician or surgeon (including, of course, the ophthalmic surgeon) may be cited to appear in the circuit court, or, indeed, if the amount sued for be small enough, in the county court.[3] If either of the parties appeals from the circuit court (in which tribunal the suit is nearly always brought) he goes to the appellate, and later, if the matter is taken still farther, to the Supreme Court.

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[1] Art. III, Sec. 2, par. 2.

[2] In New York and Kentucky the "Supreme" Court is not really supreme. In each of these states, the highest court is the Court of Appeals, while the so-called "Supreme" Court ranks next beneath.

I have not seen fit to set down in anything resembling a comprehensive manner the various jurisdictions of the different state courts, though I made an approach to this in the case of the federal system; the reason being that nearly every citizen has a fair idea of the jurisdictional field pertaining to the courts of his own state; though a hazy one indeed with respect to the competence of the courts of the United States.

[3] Only, however, in counties in which separate probate courts have been established.

As expert witness, the physician or surgeon (including, of course, the ophthalmic surgeon) may be summoned to the coroner's court, the court of a justice of the peace, to the county court, to the circuit court, and, sometimes, to the Supreme Court, i. e., in cases where this tribunal possesses original jurisdiction. He never appears, however, before the Appellate Court, because the competency of this court is limited exclusively to appeals. In the coroner's court his function is restricted to assisting the coroner's jury in arriving at a verdict as to the probable cause of death.[1] In the justice's court, his office is frequently to decide as to whether a certain injury is severe or only slight, or whether it is likely to prove fatal or not; for, on matters such as these, sometimes, in criminal cases, depends the defendant's right to bail. In this court, also, as well as in the county court, the medical or surgical expert not infrequently gives evidence on various other matters. In the circuit court, finally, his evidence is as wide as the broad field of medicine.

It is to the circuit court (or a court of like jurisdiction called perhaps by another name, as, e. g., "District Court" in Colorado) well nigh always, that the ophthalmic surgeon is called as an expert witness.

An interesting matter presents itself at this point: What is the line of demarcation separating the jurisdiction of the federal system of courts, taken altogether, on the one hand, from that of the various state systems, or sets, of courts, taken altogether, on the other? Territorially, of course, the jurisdiction is nearly the same in each instance—state courts, to be sure, being wholly devoid of authority over the high seas, over the District of Columbia, etc.—but what about subject-matter? Just what kinds of cases, in other words, are triable in the federal system and what kinds in a state system? Says the federal constitution:[2] "The judicial power of the United States shall extend to all cases, in law and equity, arising under this constitution, the laws of the United States, and treaties made, or which shall be made, under their authority; to all cases affecting ambassadors, other public ministers or consuls; to all cases of admiralty and maritime jurisdiction; to controversies to which the United States shall be a party; to controversies between two or more states; between a state and citizens of another state, between citizens of different states, between citizens of

[1] The office of coroner was abolished in Massachusetts in 1877, and that of "medical examiner" created in its stead. In case the medical examiners (who must be registered physicians) decide that the death in question was due to violence, they so report to the district attorney and to a justice of the district. Similar changes have been made in Michigan, Rhode Island and Connecticut. See "The Office of Coroner," by R. B. H. Gradwohl, M. D., St. Louis, in the *Journal of the American Medical Association*, Mar. 12, 1910, Vol. LIV, No. 11, p. 842.

[2] Sec. 2, Art. III. The section is given here in full, though partly irrelevant otherwise to present purposes, for the sake of clearness.

the same state claiming lands under grants of different states, and between a state, or the citizens thereof, and foreign states, citizens, or subjects." This grant of jurisdiction by the separate states to the federal government leaves all other jurisdiction whatsoever in the hands of the separate states. The practical results, however, are just a little different from that. Says Dwyer:[1] "In fact, many cases within the reach of the judicial power of the federal government are left wholly to the state courts; in other cases the courts of the United States have exclusive jurisdiction; while in others, the state courts are permitted to exercise a jurisdiction concurrent with the federal courts."

It happens, though very rarely, that actual conflict takes place between the jurisdiction of the federal and that of the state courts. What system, in such circumstances, has the actual cognizance of the particular case at bar? Here, again, the federal constitution speaks:[2] "This Constitution, and the laws of the United States which shall be made in pursuance thereof, and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every State shall be bound thereby, anything in the constitution or laws of any State to the contrary notwithstanding." Thus, therefore, in case of actual conflict, the federal law is supreme. *But there must be actual conflict.* Within its own proper classes of cases, the law of any state is as absolutely paramount as is that of the United States within its proper classes of cases.[3]

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1 "*Law and Procedure of U. S. Courts,*" Ann Arbor, Mich., 1901, p. 63.

2 Art. VI, par. 2.

3 If anyone should think the legal preliminaries to this article unnecessarily long, I would offer as my excuse the fact that works on legal medicine contain, as a rule, extremely little information on the important subject of courts and fundamental legal principles (these matters being continually assumed to be understood) and that, as a consequence, such information is not, as a rule, very accessible to doctors, while, as already stated, a little of such knowledge is absolutely essential to even a fair comprehension of the individual statutes and rules with regard to expert witnesses, economics, malpractice, etc. Just to illustrate in connection with the matter to which this note is appended: Not long since, a physician of excellent education and wide reading, having been threatened with a suit for malpractice in an Illinois court, had found in a widely-circulated work on legal medicine a case which had been decided by a federal court and which seemed to him to militate against his interests. He declared excitedly that, though the law in Illinois was greatly in his favor, yet that the federal law would, being higher, set aside the law of Illinois, and thus destroy his prospects in the case. He was absolutely amazed to learn that the federal decision had no authority whatever in an Illinois court, so long as the latter tribunal was acting within its jurisdiction and so long as it possessed on the point in question decisions of its own. Had it had no decision of its own, then (as will appear hereafter) the federal case would have taken on persuasive (not binding) authority, the same precisely as would the decision of any court of last resort in any judicially influential state with regard to the same question. Even had the plaintiff been a citizen of another state than that in which the doctor in question had his citizenship, and had the amount involved exceeded the "sum or value" of three (at that time, two) thousand dollars, and had the plaintiff, taking advantage of these

So much for American courts, and, briefly, the power which each of them possesses. There remains, however, a very important piece of legal machinery to be considered in connection with the most of these courts—namely, the jury. In the coroner's court, a jury—which can never be dispensed with—consists of six men. In a court of a justice of the peace there is generally no jury, but "either party may have the cause tried by a jury if he shall so demand before the trial is entered upon, and will first pay the fees of the jurors."[1] When, in a justice's court, a trial is had by jury, the body consists (in Illinois, for example) of "six, or any greater number not exceeding twelve, as either party may desire."[2] A jury (not always had) in the county court, consists of twelve men, unless the parties elect to reduce the number to six. In the circuit court there are two kinds of juries—the grand jury and the petit jury. The grand jury is a sort of inquisitorial, or provisional, tribunal, consisting of not less than twelve men or more than twenty-three, whose duty it is, in private session, to examine into various matters of a criminal nature, either on their own motion or that of a public prosecutor, and, in case they deem it proper so to do, to present to the circuit court a formal, written accusation, or "indictment." The petit jury, in a circuit court, consists of twelve men. Its duty, like that of a jury in any other court, is, generally speaking, to decide upon the facts, while the function of the judge is, speaking generally again, to determine points of law. In the circuit court, a trial is almost always had by jury (except in chancery cases, and sometimes even then). The decision of a jury is called a "verdict." The conclusion of the judge (which, in a jury trial, is of course based upon the verdict) is known as the "judgment."[3] In any petit jury, a unanimous vote is absolutely necessary to constitute a verdict, both in civil and in criminal cases. State constitutions may change this common law rule as to unanimity and have done so in some states, e. g., Missouri and Oklahoma. In a grand jury, a majority vote is sufficient if it amounts to twelve.

Trial by jury is a normal, and a very important, part of that great

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facts, actually brought her suit in a federal court, then, even then, the action, although in a federal court, would not have been subject to federal common law—for, as above stated, there is no federal common law. The case would have been decided, so far as possible, under the statutes of the state. Outside of those statutes (and the interpretations of them made by the courts of last resort within that state) neither the decisions of the state nor any federal decisions would have had the slightest binding power upon the court—which would simply have decided "in accordance with the principles of general jurisprudence." One can read and re-read individual laws without the slightest actual understanding of them, unless he comprehends in advance a few fundamental matters, such as those which are stated in this Introduction.

[1] Hurd's *"Revised Statutes" of Illinois*, 1909, Chap. 79, Sec. 48.

[2] *Loc. cit.*

[3] For a detailed and scholarly study of judgments in general, see Rood's *"Attachments, Garnishments, Judgments and Executions,"* (8 vo., Ann Arbor, 1901).

division of the legal systems of civilized countries which is known as the Common Law—i. e., the legal systems of England, and the various lands—Australia, Canada, the United States, etc.—that have taken their basic legal views from that country. It is not normally a constituent of the other grand division, or class, of legal systems—i. e., those derived from the civil (ancient Roman) law, and to which belong the legal systems of practically all the countries of continental Europe.[1] However, as we shall later observe, the jury has, to some extent, owing to the influence of the English legal system on the Continental system, been introduced into the judicial machinery of Germany, France, Italy, and even of some other continental lands.

The importance of this little body of often illiterate men, for the parties, for the judges, and for expert witnesses, can hardly be exaggerated. In common law countries, for example, in which the jury trial is so conspicuous a feature, it has given rise to an extensive and complicated branch of the law, which is known as the Law of Evidence—a body of rules relating to what may, and what may not, be presented to the jury. This great branch of the law, it would seem, does not possess an independent existence (or at all events any worth mentioning) in the civil law countries. On the jury it is, almost always, that the medical expert witness is required to shed his scientific light. To the jury it is, moreover, that, when a doctor appears as defendant in a suit for medical or surgical malpractice, his case is practically handed over for its entire decision. Indeed in Illinois, and, I believe, in certain other of the American States, the jury is made, for weal or for woe, sole arbiter not only of the facts but of the law.[2]

Great, therefore, is the jury in the various Common Law systems. Of little importance, however, is that body of men in the systems which have descended from the jurisprudence of ancient Rome.[3] The duties of a medical expert witness, accordingly, are somewhat different in common law, from what they are in civil law, countries.[4] In the for-

[1] One of the most remarkable facts of human history is this strange, this well-nigh inexplicable vitality of the ancient Roman law. That a system of jurisprudence developed in a state of society in every way so different from that of modern Europe, should persist through all the centuries and be found still applicable, is an almost miraculous occurrence. But the Romans seem to have constructed their jurisprudence as they built their roads—to last forever.

[2] Under instructions from the judge, of course.

[3] Juries were had, in ancient times, undoubtedly, both in Rome and in Greece. But these (the so-called *judices* and the *dicastæ*) were not the sources of the modern petty jury, which, as declared by Jenks (*A Short History of English Law*, p. 333) "was a mere after-thought, designed to fill the gap left by the abolition of the ordeal." This "after-thought" occurred about A. D. 1300.

[4] A fact too often lost sight of by those who propose reforms in the medical expert systems of the United States—reforms suggested, in very many instances, by the successful operation of medical expert corps to be found, here and there, among civil law countries (France and Germany, for instance, not Italy).

mer, for instance, the functionary in question addresses the jury, in the latter, the judge. In a common law land, he directs his remarks (generally speaking) to a body of mentally untrained men, incapable of complex reasoning, or, in other words, of winnowing testimony, for themselves, and hence he is bound to submit to a multitude of rules respecting what is, and what is not, "proper to go before the jury." In a civil law land, on the other hand, he addresses the judge, or, it may be, a benchful of judges, who are nearly always highly trained logicians, and, for that reason, he is wholly unhampered by our truly astounding "rules of evidence."

Now, what kinds of law do American courts—acting, to be sure, very often in conjunction with their juries—interpret, apply, and enforce? and, moreover, what are the rules, or principles, according to which are made these interpretations, these applications, these enforcements?

We have already seen that, in the federal courts, the laws applied are, chiefly: the federal constitution, the acts of Congress, and (under many circumstances) the constitutions and statutes of the several states, as well as "the general principles of jurisprudence;" that, in a state court-system, they are: the constitution of the particular state in question, the statutes passed by the legislature of that state, and, finally, the decisions of these same courts in former cases.[1] Now, in each instance— either in the federal system or in any given state system— the question, of course, arises: which of these kinds of law is of the higher force and effect? In other words, when a conflict arises betwixt constitution, statutes, and case-law (otherwise known as the common law, the judge-made law, and the unwritten [2] law) which kind of law is held to supersede the other kinds? The invariable rule is that the common, or case, law is the lowest form of law, and must give way, in case of conflict, to statutory enactment, and that both statutory enactment and case-law are controlled by the constitution. Of course, multitudes of decisions accumulate, in the course of the application of

[1] It should, of course, be understood that, in any jurisdiction, it is only the decisions of "courts of last resort" which constitute law for subsequent cases. The doctrine that the decisions of courts of last resort take on the force of law for subsequent cases in courts of any grade, is known as the doctrine of *stare decisis* (to stand, or abide, by decided cases). This doctrine prevails in England and in all the various countries which have derived their legal system from that land—Canada, the U. S., etc. In civil law countries (*i. e.*, countries whose legal principles were, as already stated, adopted chiefly from the ancient Romans—as France, Germany, Italy) the doctrine does not prevail. A judge may, if he choose, in those countries, apply the law in one way today and in another way tomorrow. This, at least, is the theory. As a matter of fact, however, a judge in a civil law country is very much guided by former decisions.

[2] Because, originally, in ancient times in England, the decisions of courts were neither printed nor written, but merely preserved in men's memories.

statutes and of constitution, and these decisions become, as it were, a part—and a very important one—of the constitution or of the particular statute which is under consideration. They, too, are a part of the law.

Again, certain rules exist for the application of case-law, or common law, at least some of which must be understood before the "legal relations" of anything whatever can be even slightly comprehended. The most important of these rules are:

1. A case of "first impression"—i. e., a pioneer case or a case which, for the first time in a court of last resort in the given jurisdiction brings up directly for decision the matter in question, does not possess so binding a force as law as do subsequent cases holding to the same effect; and, in general,

2. An old case, if others things are equal, does not possess so high an authority as one more recent.

3. Whatever is said in a case that is not strictly necessary to the decision of that case, does not take on the force of law for subsequent cases, but is only *obiter dicta*—i. e., "sayings by the way."

4. The decision of a court of last resort in any other state than that in which a case arises, has no compulsory force as law, but "persuasive authority" only—an authority which, moreover, is greater or less according (among other matters) to the eminence of the court of last resort which rendered the decision applied to. Thus, the decisions of the Supreme Court, still more the Court of Appeals, of the State of New York have always been possessed of much "persuasive authority" in the courts of other states. The same is true of the Supreme Court of New Hampshire, and of some other states.

5. A scanty, ill-reasoned opinion is of less force than a full and cogent one.

Two great divisions of the law of any country, which are absolutely necessary to be understood, may here most conveniently be discussed, though with special reference to American law—the *criminal law* and the *civil*[1] *law*.

The *criminal law* is that division of the law which relates to crimes, and a *crime* is any act or omission regarded by the legislative power as being so injurious to the general public that the government itself will punish the person or persons who are shown to be responsible for such act or omission. Any proceeding which has for its object

[1] The term, "civil law," it is well enough to notice, is employed here, as elsewhere in legal writings, in two widely differing senses. In the first acceptation it denotes the various legal systems descended from the *corpus juris civilis* of ancient Rome—as those of France, Germany and Italy. In the other sense, it signifies the *non-criminal* portion of the law of any country.

the infliction of this punishment is called a *criminal action,* or, more briefly, a *prosecution.* Crimes are of three grades, *misdemeanors, felonies,* and *capital crimes.* A *misdemeanor* is any crime inferior to a felony. A *felony* is a crime punishable by imprisonment in the penitentiary. A *capital offense* is any offense punishable by death.[1]

The *civil law* is simply the non-criminal portion of the law.

In criminal actions, or prosecutions, physicians are not infrequently summoned as expert witnesses, to assist in the unravelling of various medical or surgical tangles, especially in connection with the offenses specifically known as murder, rape, mayhem (mutilation), etc. In actions of this sort, however, the ophthalmic surgeon is naturally enough very seldom asked to lend to the jury the assistance of his knowledge and skill. It is the general practitioner that is almost always appealed to. In civil cases, however, especially in that variety known as personal injury suits (including, of course, the sub-variety known as malpractice actions) the ophthalmic surgeon is frequently subpœnaed to explain to the jury the nature of various injuries to the eye, or diseases of that organ, or of the probable extent and economic value of the disability produced by such diseases and injuries.

In connection with this matter of personal injury actions, we have to remark that these are brought invariably for the purpose of securing what is technically known as "damages"—i. e., *monetary compensation* for a damage—and that damages are of three very simple classes, or varieties: *nominal* damages, *compensatory* or *substantial* damages, and *punitive, vindictive,* or *exemplary* damages.

Nominal damages are awarded when there is a mere technical violation of a right, but no actual damage. The amount of nominal damages awarded in any given case is often very small—six cents, sometimes one cent. Such a judgment, however, throws, as a rule, the costs of the suit upon the defendant. On the other hand, in certain jurisdictions a judgment, to "carry costs," must be for "substantial" damages.

Substantial or *compensatory* damages are allowed when there is not merely a technical violation of a right, but also an actual damage, or injury. In the estimate of such damages, matters such as the following may be taken into consideration: (1) Necessary and reasonable

[1] Various definitions of some of these terms prevail in various jurisdictions, the consequence of which is confusion. The chief differences occur with regard to the word *misdemeanor.* The definitions above given are the simplest, and, possibly, as correct as any that could be stated for a general understanding. They are, moreover, those recognized by the present-day law of England. Thus, Russell, "*Law of Crimes,*" 1910, p. 10: "The word *misdemeanor* is applied to all offenses (whether at common law or by statute) which are below the degree of felony, whether they are punishable on indictment or on summary conviction."

expenses, as hospital fees, nurses' and doctors' bills; (2) loss of time; (3) pain and suffering; (4) disfigurement; (5) reduction of the earning capacity. It not infrequently happens that this last-named item constitutes by far the most important feature of the bill; hence the significance which attaches to the subject of "Visual Economics" [1]—i. e., the methods whereby can be correctly estimated the loss of earning power directly [2] consequent on the various injuries and diseases of the eye.

Punitive, exemplary, or *vindictive* damages may be recovered—in certain jurisdictions only, and these not many—when the damage was inflicted under aggravating circumstances. This kind of damages exceeds the allowance which could be made for mere compensation, adding, as it does, thereto, a larger or smaller sum by way of punishment, or vengeance, in order, as it were, to make an example of the defendant.

These various sorts of damages can thus be briefly illustrated: A commits an assault and battery on B, but without inflicting on him any material damage. B sues A, and is simply awarded a cent in recognition of his right to freedom from assault and battery. In some jurisdictions, B, under these circumstances, would have to pay the costs of the suit, as well as the one-cent damages; while, in others, the costs would have to be borne by A.

Now, suppose that A has inflicted on B a very material injury; has, for example, knocked out one of his eyes. B can recover substantial damages, the amount to be determined by adding together the various estimated values of such items as pain and suffering, doctors' bills, loss of earning capacity, etc., as heretofore stated.

But, once more, suppose that A put out the eye of B under especially exasperating circumstances; for instance, with the declaration that he destroyed the sight of the eye merely in order to render B incapable of earning a living, or of marrying a certain person, or "simply to see what the inside of it looked like." Here, in a few (a very few)

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[1] To be treated some distance *infra.*

[2] It may not be amiss to state explicitly that any damage, in order to constitute a ground for a suit for damages, must be a *direct,* not an indirect, result of the wrongful act, or, as it is often expressed, the result of a proximate, not a remote, cause. To express the matter still differently, the "damage must be the legitimate sequence of the thing amiss." An excellent example of this principle is furnished by the leading case of Scott v. Shepherd, in which it appeared that the defendant had thrown into a crowd a lighted squib. One after another of those in the crowd struck at the squib to keep it from impinging on their faces, until, at last, "it had burnt out the plaintiff's eye." The defendant pleaded that the damage was indirect, insomuch as it was really due to "the subsequent acts of others." But the court held that the acts of the others were "instinctive and innocent," and such as should have been foreseen by ordinary forecast, and that the act of the plaintiff, therefore, was the direct cause of the damage.

jurisdictions, the plaintiff would be entitled to damages in excess of those which could be considered as legal compensation.[1]

Excessive damages. This is still another term which we need to understand. The amount of damages which a jury has a right to assess is not unlimited, and, in case it assesses, or estimates, the amount at an unreasonably high figure, the damages are said to be "excessive." There is indeed no fixed rule (excepting only after "death produced by wrongful act," when the amount is usually fixed by statute either at $5,000 or $10,000); but, in case the trial judge deems the amount excessive, he has power to reduce the amount or to set the verdict aside. Higher courts, too, may declare the damages "excessive."[2]

Thus much for the courts of the United States, including the juries thereof, as well as also certain important legal principles and definitions. Let us now consider these same matters, though much more briefly, with regard to other lands. And first, as to the

Basic Legal Principles and Chief Courts of England.[3]

In England the fundamental legal principles are much the same as in America. Indeed, as suggested already, these principles were really adopted by the United States in an early day from the mother nation. In England, for instance, the doctrine of *stare decisis* or of case-law, prevails exactly as it does with us, and case-law there is subject to the same identical rules of interpretation as it is in America. The jury system, too, in that country, plays a highly important part, exactly as it does in this country. The English court-system, however, is very different from ours. For one thing, there is lacking, in England, the two-fold idea—federal and state—which makes the law of America so difficult. There is only one system, or series, of courts in England. Then, again, in England there is no written constitution; and, furthermore, questions of constitutionality are decided in that country by the legislative body—Parliament—at the time when a given law is enacted. The courts have nothing whatever to do with such questions. When, in England, a law is once passed, it is law.

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[1] A would, of course, be liable to a criminal prosecution for mayhem (mutilation) in any jurisdiction, under the circumstances mentioned. We are speaking here only of the civil action which may always be instituted by the plaintiff, or his representatives (guardian, executor, or administrator) on the same set of facts as the criminal action.

[2] Thus, in Yurkonis v. Del. L. & W. R. Co. (1914) 213 Fed. 537, U. S. District Court, E. D. N. Y.: "A verdict for the loss of both eyes by a miner 50 years of age, whose maximum annual earnings were about $900, will be held excessive unless he consents to remit all in excess of $36,000." See also a number of cases in "Negligence and Compensation Cases, Ann.," Vol. VI, p. 210.

[3] The Welsh and the Irish courts may, to all intents and purposes, be regarded as just like those of England. Not so, however, may the courts of Scotland.

The system of English courts, much simplified[4] to be sure, for general presentation, is as follows:

Coroners' Courts.—The jurisdiction is a little wider than with us. It extends to deaths and fires (where questions arise as to cause) and treasure trove.

Courts of the Justices of the Peace.—The jurisdiction, as with us, extends only to certain subordinate matters.

County Courts.—Jurisdiction extends to subject-matter whereof the value involved does not exceed £100.

Courts of Session.—Criminal cases only.

Court of Criminal Appeal.—Criminal appeals only.

The High Court of Justice.—Consists of the Chancery Division, the King's Bench Division, and the Probate, Divorce, and Admiralty Division.

Court of Appeal.—Hears all appeals from the High Court of Justice.

The High Court of Justice and the Court of Appeal are, together, called "The Supreme Court of Judicature."

The House of Lords.—Does not consist of all the members of the House of Lords, but of "The Law Lords" only. Hears appeals from the Court of Appeal, and has original jurisdiction in certain classes of cases, not necessary here to be specified.

There is only one Supreme Court of Judicature. England, however, is divided into seven Supreme Court Circuits, and the various judges of the Court apportion the work among themselves according to certain rules, and also in obedience to the ever-changing demands made upon this court by the various circuits.

Cases relating to the unprofessional conduct of physicians fall entirely within the jurisdiction of the General Medical Council—an exclusively medical body which removes the offender's name from the *Register,* (i. e., disqualifies him from practice) in case the offense is proved. The decision of this tribunal is absolutely final.

Suits for medical or surgical malpractice are brought either in the King's Bench or the County Court, according to the amount involved. An appeal lies, first, to the Court of Appeal; then to the House of Lords.

Medical expert testimony may be required in all these courts, excepting only the Court of Appeal, which, possessing appellate jurisdiction only, does not take testimony, either common or expert.

[4] Neither in the case of the English court-system nor in that of any other court-system, is the attempt here made to furnish a scientific exposition of the jurisdiction of the various tribunals named; the endeavor is merely to convey a somewhat general idea of the court-organization of the various nations in question.

OPHTHALMIC JURISPRUDENCE

Basic Legal Principles and Chief Courts of France.

In France the doctrine of *stare decisis* does not prevail. A judge may, if he choose, decide in one way to-day and in another way to-morrow, on exactly similar states of fact. Neither do ministerial edicts have the force of law in France, contrary to the generally received opinion on that point in this country. They are supposed only to interpret the law, though instances of encroachment have undoubtedly occurred. Constitution, codes and statutes—these are the three constituents of French law.

In France, furthermore, the jury system is conspicuous by its almost absence. In fact, no jury is ever employed in France, except in criminal cases, and then only in the Assize Courts, tribunals which deal, generally speaking, only with the very highest classes of crimes.[1] A jury in civil cases is unheard of. There are, in France, few technical "Rules of Evidence," no perplexing problems with respect to relevancy, materiality, or competency. The mile-long "hypothetical question" never disturbs the intellectual serenity of the medical expert, who merely hands in his report, or discusses, in a gentlemanly fashion, various matters, relevant to the issue of course, with a learned and urbane judge.[2]

The defendant, moreover, in a suit for medical malpractice (which kind of suit, by the way, for reasons to appear hereafter, is extremely rare in France)[3] does not direct a mutilated defense to a body of men who may, or may not, comprehend the nature of the scientific questions involved. On the contrary, he addresses a connected exculpation to a judge (or, it may be, to a benchful of judges) who are ably assisted by official physicians, selected either by the parties or by the court but from a list drawn up at stated intervals by the Court of Appeal in the particular judicial district in which the case is heard. Surely it would not be injudicial to say that they do "order" these things "better in France."

The court-system of France is as follows:

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[1] Even the Assize Court jury could be adopted only during the Revolution, in 1790.

[2] Neither is there in France a Grand Jury. The functions of this exclusively Common Law body are performed in France by a special officer known as the "Juge d'Instruction," a kind of Grand Inquisitor who is entitled to examine "not only the witnesses, but the prisoner himself in absolute privacy." True, there is a "*Chambre des mises en accusation,*" which works in connection with the Court of Assizes, and which is something like our Grand Jury. Nevertheless, its members are not laymen, but judges from the Courts of Appeal. The resemblance, therefore, to our Grand Jury is very superficial.

[3] Everywhere, indeed, in foreign countries, malpractice suits are far less common than among us. So far as I am able to judge, there have been more malpractice cases in the last hundred years in the United States alone than in all continental Europe.

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OPHTHALMIC JURISPRUDENCE

Civil Courts.

a. Courts of Exceptional Jurisdiction (those whose jurisdiction is delimited by statute).

1. *Courts of the Justices of the Peace.*—Jurisdiction up to 600 francs.

2. *Commercial Courts.*—Certain commercial cases only.

b. Courts of Ordinary Jurisdiction.

1. *The Civil Tribunal of First Instance.*—There is one of these for each arrondissement, France, as is well known, being divided into a number of "departements," or states, each of these being subdivided into three or four "arrondissements."

This tribunal is of great importance in connection with the matter of medical expert witnesses, for to it belongs the power, and on it devolves the duty, to construct each year a list of qualified physicians from which the official corps of "medical experts before the courts" may later be chosen. (See Court of Appeal, *infra.*)

2. *The Courts of Appeal.*—There is one of these for each of the twenty-six appellate districts, each appellate district comprising a number of "departements."

These courts are of great importance in connection with the matter of "medical experts before the courts," for this court is the body which possesses the power to appoint, and on which devolves the duty to appoint, from a list proposed, as before stated, by the Civil Tribunal of First Instance, the corps of medical experts.

3. *The Court of Cassation.*—One for all France. Sits in Paris. A court of error only. It never retries the facts, a retrial, if ordered, being referred back to a Court of Appeal other than that which heard the case before.

Criminal Courts.[1]

1. *Tribunal of Simple Police.*—Petit offenses only. Merely the criminal side of the Justice of the Peace's Court.

2. *Correctional Courts.*—All offenses involving a penalty exceeding five days' imprisonment and fifteen francs fine, except such as are reserved for the courts of the third degree, which are the Assize Courts.

3. *The Assize Courts.*—The highest classes of crimes only. The only court in France in which there is a jury.

Medical expert testimony is heard in every court in France.

A suit for malpractice against a physician would be begun in the

[1] Nothing at all like our Coroners' Courts exists in France, Germany, or Italy.

Civil Court of First Instance, and the Court of Appeal of the same district would have appellate jurisdiction.

Basic Legal Principles and Chief Courts of Germany.

In Germany, as in France, the doctrine of *stare decisis* (case-law) does not, theoretically at least, prevail. In actual practice, however, the decision of a court of last resort in the German Empire is given great weight in subsequent similar cases, and is almost always adhered to. Says Schuster:[1] "Theoretically the rule of English law, according to which the judgment of any Court establishing any rule of law is conclusive for all subordinate and co-ordinate Courts, is not accepted in Germany, and any young 'assessor' fresh from his final examination may overrule the judgment of the Imperial Supreme Court, but in practice the ruling that any Superior Court is of the greatest weight and authority. . . ." The authority of legal text-books, too, in German courts, is probably higher than in any other country. Constitution, codes and statutes, however, are, in Germany, as in all other Civil Law countries, of absolutely binding power.

The system of courts in Germany is somewhat peculiar. It is not so simple, quite, as is the system of France (which, in fact, is almost like the simple series of one of our single states) nor, on the other hand, is it quite so complicated as the American state-and-federal plan. It holds, in fact, a position midway between these two systems—the extremely simple system of France and the extremely complex system of America. The highest court in Germany, to be explicit, is a federal court (the *Reichsgericht*) and all the other courts are state courts (courts of the *Bundesstaaten*). The situation is much as if, in America, the Supreme Courts of all the states were abolished, then all the federal courts, except the Supreme Court, were done away with, and, finally, the federal Supreme Court was placed at the head of all the forty-eight state court-systems. Even then, however, we should be embarrassed by forty-eight different kinds of procedure employed in the forty-eight different state court-systems, whereas, in Germany, although the state courts are without exception supplied by the separate states (*Bundesstaaten*) the legal procedure, throughout, is absolutely uniform, being federal.

The courts of Germany are as follows:

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[1] "*The Principles of German Civil Law,*" by Ernest J. Schuster, Oxford, 1907, p. 12.

OPHTHALMIC JURISPRUDENCE

For Civil Cases.

Amtsgerichte.—Suits involving property rights not exceeding in value the sum of 300 marks ($70.00), and certain other matters requiring expedition, without regard to the amount of the claim.

Landgerichte.—Original jurisdiction in all other civil matters and appellate jurisdiction from the *Amtsgerichte.*

Oberlandesgerichte.—Appellate jurisdiction from the *Amtsgerichte.*

Reichsgericht.—The imperial court: the highest court in the German empire. Sits in Leipzig. Appellate jurisdiction from the *Oberlandesgerichte.*

For Criminal Cases.

Schöffengerichte.—Simply the penal side of the *Amtsgerichte.* One judge and two laymen (or *Schöffen*). Competent for all *"Uebertretungen"* for the so-called *"Antragsvergehen"* and for those *"Vergehen"* punishable at the most with three months in jail or a fine of 600 marks ($140.00).

Landgerichte.—Penal Chamber thereof. For all other *"Vergehen"* and also for *"Verbrechen"* which are punished at most with five years in the house of correction, and for the *"Verbrechen"* of juvenile persons.

Appellate jurisdiction over *Schöffengerichte.*

Schwurgerichte.—Three judges and twelve jurymen (*Geschworene*). *"Verbrechen"* which do not fall within the jurisdiction of the Penal Chamber of the *Landgericht* or of the *Reichsgericht.*

Oberlandesgerichte.—Sit in appeal from judgments of the Penal Chamber of the *Landgericht* which the chamber heard on appeal, and in first instance cases from that chamber where the revision is grounded exclusively upon some legal rule contained in the *Landesgesetzen.*

Reichsgericht.—Penal Chamber thereof. Appeals from *Schwurgerichte* and from the Penal Chamber of the *Landgerichte* in cases in which that chamber had original jurisdiction.

Original and final jurisdiction in treason and high treason against Kaiser and Kingdom.

The court in which either a prosecution or a civil suit for malpractice would be brought, would be the *Landgericht*—in the case of a prosecution, the penal chamber of the court, of course. The *Landgericht* may, however, refer the case for trial to the *Schöffengericht,* whenever it is perfectly obvious that the case (if a prosecution) cannot result in a judgment for more than six months' imprisonment or a fine of more

than 1,500 marks; and it may even refer a civil suit for malpractice to the *Amtsgericht* whenever the amount of damages demanded does not exceed 600 marks. A matter which seems peculiar to Americans is the extent to which both medical and surgical malpractice are, in Germany, regarded as criminal matters. Thus, it happens again and again, in that country, that the same professional negligence, or alleged negligence, is both sued upon and prosecuted simultaneously. The injured person, however, is not obliged to wait (as in some lands) until the criminal action has been disposed of before he can bring his suit for damages. Nor is he obliged to sue simply and solely because a prosecution has been brought. The prosecuting attorney (*Staatsanwalt*) is, on the contrary, under official obligations to prosecute whenever he learns of a case of probable malpractice—which, not infrequently, is when he first receives intelligence that a civil suit has been begun. It is generally the case, however, that the injured person allows, or causes, the criminal prosecution to precede his civil suit, because, in the criminal action he has no costs to pay, however the case is decided, and also because, if the criminal action is decided in his (i. e., the State's) favor, then he is absolutely certain of a judgment in his case for damages, while if, upon the other hand, the defendant is discharged in the criminal action, such a judgment is no bar at all to a later suit for damages. An appeal from the *Landgericht* would lie to the *Oberlandesgericht* and, thence, to the *Reichsgericht*. The functions of a medical court-expert in Germany are pretty well indicated by the jurisdictions of the different courts. The peculiar hierarchy of medical officials in Germany will be explained later.

Basic Legal Principles and Chief Courts of Italy.

The fundamental legal views of Italy are much the same as those of France. Judicial decisions (*giurisprudenza*) have, as in France, no force at all as law—except as "persuasive authority"—still, contrary to the case of France, ministerial edicts do possess binding authority. The system of courts in the two countries is very similar. Thus, in Italy:

For Civil Cases.

Judici di Conciliatori.—Jurisdiction up to 100 francs.

Pretore.—Jurisdiction up to 1,500 francs.

Tribunale.—Original jurisdiction in all claims of over 1,500 francs, and appellate jurisdiction in certain cases from the pretore.

Appello.—Court of Appeals. Hears appeals from the tribunale.

Cassazione.—Highest court in Italy. Jurisdiction where error has been committed on either side.

For Criminal Cases.

Pretore.—Petty cases.

Tribunale.—The penal chamber thereof.

Corte d'Assise.—Where the crime is punishable by not less than five years imprisonment. Tries by jury, the assize court being, as in France, the only tribunal which acts in conjunction with a jury. No appeal.

A civil suit for malpractice would be begun either in one of the pretorian courts or in one of the tribunale, according to the amount of the demand. A marked peculiarity, however, of the Italian law, is that a judgment for damages cannot be secured against a physician until a criminal prosecution has first been brought against him, and successfully, on the same state of facts.

There is no corps of "official expert witnesses before the courts" in Italy. The medical expert system is, in fact, almost the same in Italy as it is in Common Law countries.

We have now reviewed, in a very brief manner, the court-systems and fundamental legal principles of the various lands proposed to be considered in this section—America, England, France, Germany, and Italy—systems and principles which, to some degree, must be kept in mind, if the remaining (and more specific) portions of this article are to be really comprehended.

II.

OPHTHALMIC EXPERT TESTIMONY.

A.—Legal considerations.

Legal considerations regarding ophthalmic expert testimony in the United States. In America, as in every civilized country, witnesses are, from the nature of the testimony which they give, divided into two very sharply differentiated classes—ordinary witnesses and expert witnesses. The former class simply testify to facts, the latter—the expert—to opinions that are founded upon facts, either actual or assumed. Says Hutchins:[1] "Ordinarily it is the province of the jury to consider the facts in the case, and, uninfluenced by the opinions of witnesses, draw such inferences therefrom as their judgment may dic-

[1] "The Physician as an Expert," *Michigan Law Review*, Apr., 1904, Vol. II, No. 7, p. 601.

tate. But in cases involving questions outside of the ordinary range of inquiry, in which correct conclusions can be drawn from the facts only by means of scientific deductions, it is apparent that most jurors would be unable to perform the functions that the law imposes upon them, unless aided in their deliberations by the judgment and opinions of witnesses skilled and experienced in the subject under investigation." From this it readily appears that the expert witness is really an interpreter of the facts. He stands to the jury (or, in some instances and lands, the judge) in much the same relation as a linguistic interpreter does in the case of a witness who cannot speak the language of the court in question, or of a witness who is deaf and dumb. He tells the jury or the judge the real meaning and import of the facts adduced by the ordinary witnesses—a meaning and an import which the judge or the jury could not, presumably, extract from these facts themselves, by reason of their lack of special education with regard to the matter in question.

An expert witness may be a carpenter, a miner, a railroad man or a chemist, a lawyer[1] or a dealer in silks; in very many cases he happens to be a druggist, a dentist, or a doctor; in every case, however, he is called upon to aid the jury or the judge to interpret ordinary facts by means of the expert, unordinary, knowledge which he possesses. Here, of course, we shall treat of these matters with especial reference to the needs of the doctor, and with more especial reference still to those of the ophthalmologist.

First of all, however, it is well enough to understand that certain things are so generally known and accepted that they do not need to be proved by any kind of evidence whatever. Such matters are said, in legal parlance, to be "judicially noticed." Among such matters are: The existence and titles of sovereign powers, their flags and seals, the general customs of merchants, the movements of the astronomical bodies, legal weights and measures, matters of public history, domestic law,[2] etc. All these and various other matters need not be proved. The court is presumed to know them.

Then, too, there is a kind of evidence which does not depend on human testimony—namely that which arises from what is legally described as "autoptic proference," i. e., the displaying of the thing itself. Says Wigmore:[3] "If the question is whether a man is of negro complexion, or whether a shoe is fastened by laces or by but-

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[1] See the next succeeding footnote.

[2] But not foreign law. Foreign law, as hinted *supra*, must be proved by expert testimony given by those who are specially skilled in the subject.

[3] Note to Greenleaf on *Evidence*, 16th ed., 1899, p. 27.

tons, the testimony of one who has seen the man or the shoe, or the circumstance that the man's child is a negro or that a button has fallen from a shoe, can at least not be more satisfactory than the inspection of the man or the shoe in court." Thus a judge may take his watch and note "the length of a minute for the benefit of the jury," and a doctor may demonstrate the effects of an injurious substance, and a man whose eyes have been removed may, under appropriate circumstances, exhibit before the court his empty sockets.

Then, finally, there comes human testimony. This, as a matter of course, plays the star part in almost every trial.

Now, to return to our beginning point, the witnesses who render human testimony are of two great, widely differing varieties—the ordinary and the expert, the latter of which will be considered here.

In treating of expert witnesses we divide our subject thus: *Attendance in court, how secured; competency; examination and cross-examination; privileged communications; matters concerning which an expert witness may testify; manner of testifying; fees.*

The *attendance in court* of any witness is secured by the service of a writ called *subpœna ad testificandum.* The service is accomplished by showing the original and leaving a copy thereof, or else a ticket containing the original in substance. In civil cases there must also be made a payment, or at least a tender, of the amount required for mileage as well as for one day's attendance at the court. In criminal cases, however, the witness pays his own expenses, being afterwards reimbursed by the court in accordance with various provisions of the law.

In court, immediately after the swearing of the witness, there arises the question of his *competency.* In fact, the competency of a witness to testify as an expert must always first be shown before he is permitted to testify in his expert capacity. (Of course, the same man may be testifying both as ordinary and as expert.)

Now then, what is an expert, especially a medical expert? In other words, what qualifications are necessary to constitute a man a medical or surgical expert, or to render him "competent?" This is a question of very great importance to the ophthalmic surgeon, as the merest matter of course. In the very first place we may remark that, in order to testify as a medical or surgical expert even in a case of injury to the eye, it is by no means necessary, from a legal point of view, that the witness should be an oculist or even a specialist with any sort or kind of limitation whatever on his practice—as eye and ear only, or only eye, ear, nose and throat. Nor is it necessary that he ever have made a special study of the eye. Nor is it at all essential that he be

a graduate of any particular school of medical practice. Nor, further, that he be a graduate at all, or even a licensee on the ground of years of practice. Nor that he be in the active practise of his profession, or that he ever have practised at any time. None of these matters go at all to the question of the admissibility of the evidence. Such things (i. e., minority of qualification) may, indeed, be shown, on examination either direct or cross, but such matters simply affect the *weight* which the jury may see fit to attach to the testimony that is rendered: they do not *bar* the testimony.

Nevertheless, certain qualifications are really necessary to constitute a man a medical or surgical expert. Now what are these qualifications? They are, in short, *whatever* will tend to confer upon the witness unusual knowledge or skill relating to the matter in question. Thus, in Lind v. Masonic Ass'n of Western N. Y.,[1] a nurse who had witnessed a surgical operation was permitted to testify for what disease the operation had been performed, on the ground that, for twenty-one years he had been a nurse in a hospital and had seen much general and surgical work. Thus, again, in Mason v. Fuller,[2] it was held that a woman who had had no training whatever in medicine, or indeed even in the single branch of midwifery, but who had had long experience as a nurse in child-birth cases, was competent to render expert testimony as to whether the birth of a child was premature. Said the judge: "The witness, by her experience and observation, appears to have acquired knowledge of the subjects about which she was testifying that persons generally do not have." In State v. Cook,[3] it was held that a chemist and toxicologist who was not a physician and surgeon, and who had had no medical training whatever, was competent to testify as an expert concerning the effect of strychnine upon the human stomach and the system in general. In Everett v. The State,[4] it was held that a physician and surgeon who had been in active practice, but who, at the time of the trial, had been retired from professional work for some time, was sufficiently well qualified to testify as an expert. In Tullis v. Kidd,[5] it was held that a witness, to qualify as expert, need never have been engaged in active practice. Said the

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[1] 88 *N. Y. Sup. Ct. R.* 287, 30 *N. Y. Supp.* 775.
[2] 45 *Vt.* 29.
[3] 17 *Kan.* 392.
[4] 62 *Ga.* 65.
[5] 12 *Ala.* 648, 650. The opinion as to the competency of this particular witness would seem to be *obiter dicta.* Moreover, the case is not a "recent" one, dating, as it does, to 1847. Nevertheless, it is quite within the spirit of legal holdings regarding these matters generally, and would probably be taken as law in almost any jurisdiction in the U. S., where the matter is not controlled by statute.

court: "If one asserts an ability to give correct opinions upon any art or science, from an acquaintance with the subject, acquired by observation and study, we cannot perceive on what ground he can be rejected because he has not been in the actual practice of his profession." In the same case, as it happened, a similar question of competency arose. The witness had attended a course of medical lectures, been licensed by the state, and had practised medicine for one year. Then he had abandoned medicine for the law, and had been engaged in legal practice for sixteen consecutive years. He was held to be competent as a medical expert, partly on the ground that he had never quite ceased to read medicine.

Another extremely interesting instance arose in California.[1] In this case it was held that a Catholic priest might testify as an expert in the matter of mental soundness or unsoundness. The opinion was based to some extent on the ground that the education which this clergyman had received in his school of theology, had been designed in part to fit him to examine into and decide upon such matters. Said the court: "It was a part of his collegiate education, and it was especially a matter of daily practice with him for ten years to familiarize himself with the mental condition of persons upon whom he was called to attend in his character as a priest; and it does seem to us that, from both education and experience, he was peculiarly qualified to express an opinion, as an expert, on the question of mental diseases."

The culminating point of interest, however, regarding this matter of medical expert competency, for the ophthalmologist at least, lies in the fact that the law does not require the witness to have made a specialty, either in practice or in study, of any of the matters concerning which he is called upon to testify.[2] Thus a man who has never seen a case of glaucoma (sometimes, perhaps, who has never read a report of a case—for such men actually exist) is permitted to testify, merely from the sketchiest text-book knowledge of the subject, as to whether or not a given set of symptoms should, or should not, have been diagnosed as glaucoma, and as to whether an iridectomy therefor

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[1] Estate of Toomes, 54 *Cal.* 509.

[2] Hathaway v. National Life Ins. Co., 48 *Vt.* 335, 351; State v. Reddick, 7 *Kan.* 143; Hastings v. Rider, 99 *Mass.* 622; Horton v. Greene, 64 *N. C.* 64; Kelly v. United States, 27 *Fed. Rep.* 616; s. c., 8 *Cr. Law Mag.* 174. In Castner v. Sliker, 33 *N. J. L.* 95, it is held that a physician may testify fully as to various ocular injuries, though neither oculist nor surgeon. Thus, too, Wigmore, citing seven cases, in a note to "Greenleaf on *Evidence*," 16th ed., 1899, p. 54: "On matters in which special medical experience is necessary, the question may arise whether a general practitioner will suffice, or whether a specialist in the particular subject is necessary. The courts usually and properly repudiate the finical demand for the latter class of witnesses." The same writer, *loc. cit.*: "As to sanity, it is now universally conceded that a layman is competent to form an opinion."

should or should not have been performed at all, and whether or not, in case it was performed, it was performed correctly. Perhaps even a nurse in an ophthalmic hospital would be permitted to give evidence on such matters. The absurdity (medically speaking, of course) is sufficiently manifest, but, in the eyes of the law, is entirely removed, or, rather, "remedied," by the fact that the opposing counsel is always permitted to show, on cross-examination, just how slight the expert's real expertness is. However, to one who understands even a very little of human nature (and glaucoma) this privilege of cross-examination constitutes by no means a sufficient defense against misapprehension on the part of the jury. The really inexpert expert's testimony may leave some sort of impression on the jury, whereas, as a matter of course, it ought not to leave any. The testimony of such an "expert" should be inadmissible.[1]

But this is not all. It is held that a specialist in diseases of the eye may not testify regarding medical or surgical matters that do not lie within his special field.[2] Says Rogers, in his admirable work on "*Expert Testimony,*" p. 101: "But one who devotes himself exclusively to one branch of his profession, making a specialty of that, and having no practical experience beyond it, is incompetent, as a general rule, to express an opinion on a question that does not pertain to his specialty." So a specialist that has never been engaged in general practice, cannot testify regarding medical matters generally, whereas a general practitioner, who has never been engaged in special practice, or indeed in practice of any sort or variety, but who has only "studied medicine," may testify regarding matters medical, whether of a general nature or a special. Nay, further, a man who has never even studied medicine, but who has merely served as a nurse, or acted as a minister or priest, may, under certain circumstances, exercise the functions of the medical expert, either general or special.

No doubt the proper rule should be that expert testimony should be really expert; that, for instance, only internists in actual practice at the time of testifying should be permitted to testify regarding matters of internal medicine, practising surgeons regarding surgery, dermatologists regarding dermatological matters, and, similarly, in the case of oculists, aurists, and specialists of every kind. "Pantologists" do not exist, and courts should recognize the fact. Provision,

[1] The following may be instructive: In a certain trial I heard a physician on the witness stand repeatedly refer to a pterygium as a "strinthium." Another "expert," preparing for another trial, spoke often of a "silk-fork" fracture of the radius. These Mrs. Partingtons of the witness-stand might very appropriately be abolished.

[2] Fairchild v. Bascomb, 35 *Vt.* 410.

of course, should be made for cases where the "best" evidence could not be obtained, as where, owing to the distance from medical centers, actual experts were not, practically at least, procurable, and where, owing to the death or disappearance of some person, a witness who had actually seen and examined that person would, though not an actual expert, necessarily testify, if any sort or kind of testimony in the matter were to be obtained at all. Some of these matters, of course, could and should be placed within the discretion of the trial court. The prevailing rule, however, should be in accordance with that general principle of evidence, which "requires the best evidence of which the case in its nature is susceptible." [1] A general practitioner cannot give the "best" evidence regarding injuries to, or diseases of, special organs.

It is only fair to add that in the state of Wisconsin a little has been done by statute[2] in the way of barring certain inexpert experts. In this state "no person practising physic or surgery, or both, shall have the right . . . to testify in a professional capacity as a physician or surgeon in any case unless he, before the twentieth day of April, 1897, received a diploma from some incorporated medical society or college, or shall since said date have received a license from the state board of medical examiners." This, as will be seen, bars the nurses, the students, the midwives, and the clergymen, but, unfortunately, does not exclude the inexpert expert who happens to be the proud possessor of a license or a diploma, and yet who cannot distinguish glaucoma from iritis.

Immediately upon the establishment of the "expert's" competency, follows, of course, the *direct examination* and then the *cross-examination.* By "direct examination" is meant the "examination by the counsel for the party in whose behalf he was called." Under this examination the witness may either (a) tell his story in narrative form, or (b) respond to various (and generally numerous) questions. When giving his testimony according to the latter method, the questions must not be "leading"—i. e., such as suggest the answer desired. The ordinary witness, too, must confine himself strictly to facts, excluding rigidly all opinions or inferences; the expert, however, may, within certain limitations of course, give testimony as to opinions; in truth he is really an "opinion" witness.

The cross-examination is made by the opposing counsel, and its purpose, of course, is to overthrow or weaken the testimony rendered under the direct examination. In the cross-examination, leading ques-

[1] Greenleaf on *Evidence,* 16th ed., 1899, p. 170.
[2] *Wisconsin Statutes,* 1898, Vol. I, Sec. 1436.

tions are permitted. The "latitude" (i. e., scope, or field, covered by the questions) allowed in the cross-examination is different in the different states. On the whole, the best rule would seem to be that a witness is subject to cross-examination on everything that is relative to the *case*. The rule most generally adopted, however, is that the cross-examination must be limited strictly to matters concerning which the witness testified under his direct examination. The whole matter of latitude, however, lies largely within the discretion of the trial judge.

All the evidence, it may be noted, in passing, must be relevant and competent. By relevant is meant "of sufficient probative value to be admissible at all."[1] By competent is intended, legally fit, regardless of the question of relevancy. One of the subordinate rules coming under the rule requiring "competency," is the so-called "best evidence" rule, by which is meant, as before stated, that a court will require to be produced "the best evidence of which the case in its nature is susceptible." Another subordinate rule, under the general rule of competency (perhaps, too, falling under that of the "best evidence") is that "hearsay evidence is not admissible." Thus, a physician, for example, may not testify that another physician had said to him that such and such an injury might very readily have caused the plaintiff's traumatic cataract. He must give his own opinion. If the opinion of the other physician be desired, then that other physician must be brought into court, there to render such opinion.

Closely connected with the subject of direct and cross-examination, is that of *privileged communications*. Even in the earliest times in England (from which country we inherit, as before stated, most of our fundamental legal principles) certain matters have been considered inviolably sacred, and have been most carefully protected from disclosure in the courts. Such matters were called "privileged communications," and were privileged at the common law—i. e., they did not require a statute for the purpose of rendering them privileged. It was "case law," or "judge law," or "common," or "unwritten" law. These privileged matters were, in general: State secrets, deliberations in the jury room, communications between counsel and client, and communications of a confidential nature between husband and wife. Communications, however, made to clergymen and doctors, though sacred in fact, were not held to be sacred, or "privileged," in law. Hence these matters are unprivileged still, even in the United States, except so far as has been provided otherwise by statute. Happily, in most of the states of this country, statutes have been enacted which,

[1] Greenleaf on *Evidence*, 16th ed., 1899, p. 36.

with certain appropriate limitations, protect the physician from disclosing on the witness stand, without the patient's consent, "any communication made to him by his patient with reference to any physical or supposed physical disease, or any knowledge obtained by a personal examination of any such patient."[1]

As to the *matters concerning which an expert witness may testify,* we may say that these, in a word, considered together, are about as wide as the whole broad field of medicine. Most commonly in question, however, in courts of law, are the following medical topics: Whether a given person is insane; the cause of a certain death; whether a certain disease is incurable; whether a certain disease is curable without operation; what might have been the cause of a given injury; what a reasonable bill would be for certain medical or surgical services; whether a certain affection is or is not painful; the degree of reduction in earning power produced by a given disease; the probability of this reduction (or of some disfigurement) being permanent or temporary.

As to the expert's *manner of testifying,* it is hardly necessary here to enter upon the customary platitudes, such as that the expert should always be honest; that he should neither speak too loud nor yet in a whisper; that he should always act the gentleman; never put in technical terms what could be more simply stated; etc., etc. However, one admonition may not be out of place: viz., an expert, and more especially an *expert* expert, as an ophthalmic surgeon is always supposed to be, should ever be exceedingly careful not to express an opinion with too great particularity. This, I think, is a fault to which the specialist is notably prone. He seems, in fact, to feel that he is expected to be very precise and accurate, just because he is a specialist. Nevertheless, he should not testify, for example: "My opinion is that this traumatic cataract was caused by a blow from a heavy cane," for, in fact, no one could tell, merely from the injury, whether a given cataract had been produced by a heavy cane or a light one. To refer to an actual instance: He should not allege that a certain detachment of the retina had been produced by a snowball, squeezed very hard. The same detachment might, in truth, have been produced by almost any solid object impinging upon the eye with violence.[2]

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[1] The language of the statute varies, to be sure, in the different states. The matter above quoted is from the Kansas statute.

[2] I saw, however, an interesting case of ocular injury (never the subject of legal investigation) in which an expert witness could easily and truthfully have testified with exceedingly great precision. The wound had been inflicted by a butcher with his "steel," or knife-sharpener, on a customer with whom he had had an altercation in his shop. The partly punctured, partly contused, character of the wound in the cornea, together with the presence of raw beef fibres in the

An expert witness, as before stated, may testify either to facts or to opinions; i. e.—either in his ordinary or in his expert capacity. When testifying to opinions, his opinions may be based either on facts observed and testified to by himself, or on facts observed and testified to by others. In the latter contingency (and in that alone) the questions which are asked him must ever be fashioned in what is technically known as the hypothetical form. It therefore behooves the medical expert to understand somewhat the nature of *the hypothetical question.*

Now, what is "the hypothetical question?" The hypothetical question is a question which is based upon the assumption that all, or part, of certain facts already in evidence, or yet to be placed in evidence, is true. It *assumes,* or *hypothecates,* the truth of certain fact-testimony, in order that the opinion-witness, i. e., the expert, may have an opportunity to render an opinion thereon. The very reason for the existence of such a form of question, is that it is not the function of the expert, but of the jury, to determine whether or not such fact-testimony is true. The jury may accept the fact-testimony together with the opinion which is based upon it, or the fact-testimony without the opinion, but, under no circumstances, of course, can it reject the fact-testimony and accept the opinion.

Perhaps an illustration will serve to clarify the nature of this important kind of question. Doctor A, an oculist, is called to the witness-stand. Having been sworn and qualified, he is asked, for instance, "What did the defendant then do?" *Ans.*—"He struck the plaintiff with a stick." *Q.*—"On what part of the body did the blow fall?" *Ans.*—"I do not know; I was not close enough to tell exactly." All this, it will be observed, is merely "ordinary," or fact, testimony—such as any witness might conceivably be able to furnish. Suppose, now, another physician, Doctor B, has testified that the plaintiff's uninjured eye is only rudimentary and has never at any time had sight, and, further, that very shortly after the assault he, Dr. B, dressed the left eye (the eye which defendant is said to have injured, and for damages to which the present suit is brought) and that, in the injured eye, he found a sliver of wood 2½ inches long, ½ inch wide, and ⅛ inch thick, impaling the eye "fore and aft," passing from the center of the cornea to the back of the eye, there perforating the wall of the eye and piercing the orbital fat, or cushion on which the eye is supported. In this condition (still other evidence has shown) the plaintiff walked along six blocks, making three turns, picking his way

anterior chamber and in the conjunctival cul de sac, bespoke the nature of the instrument with which the wound had been inflicted, to a high degree of certainty.

over crowded crossings, and avoiding by himself numerous vehicles and foot passengers, that then, still unassisted, he ascended the stairs to Dr. B's office and rang his bell. Now, counsel for defendant desires to show by Dr. A that such acts could not have been performed by anyone with his eyes in the condition above-mentioned. His question will have to be hypothetical, because it is based on facts (and opinions admitted on both sides—which are treated as facts) that had been testified to by others. *Q.*—"Could a man with one eye blind from birth and with the other impaled 'fore and aft' by a sliver of wood 2½ inches long, ½ inch wide, and ⅛ inch thick, passing from the center of the cornea to the back of the eye, there perforating the wall of the eye and piercing the orbital fat, or cushion on which the eye rests—could a person in such a condition have walked, alone and unassisted, six blocks, making three turns, picking his way over crowded crossings, etc., etc.?" *Ans.*—"In my opinion, he could not."

But suppose that Dr. A has been asked to examine the plaintiff, and to report upon the findings. He discovers, let us say, in the plaintiff's left eye a small circular scar on the cornea, 2 mm. in circumference, well off the pupillary area, and, in addition, a sound lens, a sound vitreous, a sound fundus—in short a totally sound eye in every single particular, saving and excepting the corneal opacity only, that being so situated as not to interfere with the sight. The doctor may now be examined *actually,* instead of *hypothetically;* for the reason, as above-stated, that he now is "personally acquainted with the material facts in the case."[1] He may be asked, for instance: "What did you find?" *Ans.*—"I found on the left side an eye perfectly sound in every way, excepting a slight scar on the cornea." "Where was this scar situated with reference to the pupil?" "To one side of it." "Does it interfere with the sight?" "No." "Is there anything to show that the eye may not have perfect vision?" "There is not."

It is well enough to note, before we leave the subject of the hypothetical question, that the term "hypothetical" has reference to the sense and not to the mere verbal form. What is really necessary is that the question hypothecate, i. e., assume for the time being, instead of deciding, the truth of more or less of the fact-testimony. A question may, indeed, be cast in hypothetical form (see, for instance, Fairchild v. Bascomb, 35 *Vt.* 415) and yet, after all, be of such a nature as to require the expert, should he respond, to decide upon the truth of the evidence. On the other hand, a question not at all hypothetical, linguistically considered, may yet avoid the error referred to.[2]

[1] Rogers on *Expert Testimony,* 1891, p. 75, footnote 2.
[2] Gilwan v. Town of Strafford, 50 *Vt.* 726.

The test is: Does the question require the expert to decide upon the truth of any fact-testimony (besides that given by himself, of course) and thus to take that function from the jury?

A subordinate, yet not wholly unimportant, matter is that of the expert's *fees*. We have already seen that, in criminal cases, no fee of any sort need ever be paid or tendered to render valid the service of the subpœna, while, in civil cases, the mileage and *per diem* must always be paid, or tendered, to the prospective witness (whether expert or ordinary) to render the servic of the subpœna effective. No payment or tender, no service. Now, in the case of the ordinary witness, that is all the pay there is, even in civil cases. At least it is all that there ever should be. In the case of the ordinary witness, any further compensation is likely to get him into trouble, on the ground of bribery, or even perjury. When, however, the witness is summoned to give, not ordinary fact-testimony, but scientific opinions involving the possession of learning and skill, then a much-mooted question very naturally arises. Ought, or ought not, an opinion witness, an expert, to be obliged by the law to hold his store of knowledge free for the use of all who take it into their heads to litigate? To illustrate: Here is a civil suit against a railway company, brought in the Alexander County, Illinois, circuit court—a case which requires for its proper decision a certain amount of expert medical knowledge and skill. An oculist, we will say, is subpœnaed from Chicago. He is obliged, possibly, to come in person to Cairo, to lose perhaps several days of his practice, and to undergo in addition various sorts of inconveniences. He has, moreover, to "turn himself wrong side out" for the benefit of people whom he has never seen, who care nothing for him or his interests, and who are striving, the one side to get money, the other side to keep it; and the question is, Shall he do all this for nothing, or, at all events, what is practically nothing—i. e., his mileage and a nominal *per diem*—not quite enough, perhaps, to pay his actual expenses, to ignore the matter of his loss of practice in Chicago? The ablest writers answer the question thus: No, he ought not; the expert's learning and skill are his property, and the law has no more right to compel him to render expert testimony against his will, or at least without adequate compensation, than it has to compel him to render professional services of any other sort. However, the writers and the courts are very much at variance, and, unfortunately for the expert, the courts are not at variance with each other on this question. They hold, with very unusual unanimity, that the expert, medical or lay, may be compelled to testify in his expert capacity without other compensation than that of an ordinary witness. The court of last

resort (Supreme Court) in Indiana has indeed held to the contrary, but, even in that state, the decision has been annulled by a statute, while, on the side of the general rule, are ranged the highest courts of Alabama, Illinois, Arkansas, Colorado, Texas, Minnesota, and even of still other states. It has been suggested that the rule, in its actual application, works no injustice, since, in no case whatever, would counsel be willing to take his chances with a medical witness angered by the non-payment, or the prospect of non-payment of extra compensation. This suggestion, however, amounts simply to an insinuation that medical experts will, as a rule, in case they receive no extra compensation, be willing to perjure themselves—an insinuation which physicians, naturally, resent most bitterly. Moreover, in many cases, the party summoning the expert is a pauper, who, of course, cannot pay the "extra compensation" in advance, and who, after receiving a judgment for say ten or twenty thousand dollars, divides the amount with his lawyer, and then, knowing that the law allows no extra compensation to the doctor, says to the medical expert, "For you, nothing." This may happen, too, after the doctor has made most arduous preparation for the case—perhaps quite as arduous as that which has been made by the lawyer himself.

However, the situation as a whole is not so bad as the judge-made law would seem to make it. In several states statutes provide for the payment of special fees to experts. Among these are: Iowa, Louisiana, North Carolina, Rhode Island, and Wyoming.

In any case, where an expert accepts, or is promised, extra compensation, the retaining or receiving of this extra payment should never be made contingent upon the success of the side in whose behalf the physician is called upon to testify. Everything should be strictly ethical and fair, for the reason, if not for any better one, that the entire matter of the expert's compensation may be brought out fully before the court in his cross-examination.

Legal considerations regarding ophthalmic expert testimony in England. In England the law relating to expert witnesses is much the same as in America. In fact, in neither of these lands is there anything at all resembling an official corps of medical experts, such as, later, we shall find exists in Germany and France.[1] Furthermore, as we saw some distance *supra,* the common law (decisions of courts of last resort) in America has a certain degree of persuasive authority in the courts of England, just as the reverse holds true.[2] It is, then (partly, no doubt, in consequence of this persuasive authority) a fact

[1] But not Italy.

[2] American cases are frequently cited in English text-books and vice versa.

that the English law relating to expert testimony is almost identical with the law on the same subject prevailing in America. The method of securing attendance in court, the rulings with regard to competency, the procedure relating to examinations and cross-examinations, etc., etc.—these and various other affairs relating to expert—as well as ordinary—witnesses, are managed in England almost the same as in America. Especially worthy of notice is the retention in the mother country of the old-time rule already adverted to in this article of excluding the testimony of physicians from the list of matters regarded by the courts as "privileged." Thus *The Encyclopedia of the Laws of England:*[1] "The statute law of many foreign countries enforces this obligation [of medical secrecy] by penalties, and regards it as sacred even in the witness-box. English law, however, takes a different view, and, if the judge sees fit, compels a medical witness to reveal in open court the most confidential communications, and to disregard the most solemn promises." In England, therefore, the law on this point is exactly the same as it is in the different states of the United States (for example, Illinois) where the matter has not been changed by statute.

Legal considerations regarding ophthalmic expert testimony in France. The medical expert system of France, though not entirely transferrable to a Common Law country like ours, is nevertheless so excellent and in so many particulars, and, moreover, spite of the recent date of its adoption, has worked so admirably, that we take great pleasure in presenting it here with just a suggestion of detail.[2]

We shall deal with the subject under the heads of: (1) Appointment of medical experts. (2) Procedure of medical investigations in civil matters. (3) Procedure of medical investigations in criminal matters. (4) Medical expert reports.

Appointment of medical experts.—At the commencement of each judicial year, and in the three months following the opening of the court, the Court of Appeals, sitting in council, together with the aid and consent of the procureur general, appoints from a list prepared (as stated heretofore) by the civil tribunals of first instance a number of physicians on whom the appeals court confers the title of "expert before the courts." In the Court of Appeals of Paris, the appoint-

[1] 1900-1909, Vol. 9, p. 126.

[2] I am informed by an eminent French authority that perhaps the only objection which could properly be raised to the French expert system is that "experts are not always appointed with a great deal of care." Thus, for example, general practitioners are not infrequently assigned to duties that properly belong to the field of specialism, and *vice versa.* Again: "It has happened that the court in certain instances has appointed a specialist in one matter as expert in regard to another specialty."

ments in question are made by the first three chambers of that tribunal.

The conditions of eligibility to appointment by any Court of Appeals are: 1.—That the physician be of French nationality.[1] 2.—That he have his legal domicile either in the arrondissement of the tribunal, or, at all events, within the territorial jurisdiction of the Court of Appeal by which he is appointed. 3.—That he shall (a) have had at least five years of the actual practice of his profession, or (b) be furnished with a diploma from the University of Paris bearing the mention, "Legal Medicine and Psychiatry," or one of the analogous diplomas conferred by the other French universities.

Expert investigations and examinations may, in general, be conducted only by physicians who bear this title of "Expert before the Courts," and, as a natural consequence, such experts appear in every class of cases and in every court, even the Court of Cassation. According to the *Code of Criminal Procedure*,[2] however, other physicians may be appointed in cases of "flagrant crime, inquiries ordered by a Court of Appeal, or measures taken by the president of a Court of Assizes by virtue of his discretionary power." Other cases in which non-intitulated experts may be appointed are: When the experts properly intitulated by the Court of Appeals are for good reason disqualified to act in a particular case (as by consanguinity, affinity, personal interest in the suit, etc.) when there is great urgency, and also in other cases by reason of special circumstances. In every case, however, of such anomalous appointment, the order of appointment must be supported by a written statement of the reasons for which the anomalous appointment is made. Further, even in the case of anomalous appointments, the appointee must be a French physician.

The experts are appointed either by the court or by the parties, sometimes by the parties and the court acting conjointly.

The foregoing rules relating to the qualifications and the appointment of medical experts, apply indifferently in civil and in criminal matters. The procedure, however, according to which expert investigations are conducted, differ somewhat in the two classes of cases.

Procedure of medical investigations in civil matters.[3]—1.—The expert, or experts, whether appointed by the courts or chosen by the

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1 The law on this point is very explicit and positive: "Les fonctions de médécins experts près les tribunaux ne peuvent être remplie que par des docteurs en médecine français."—L'article 14, Sec. 1 er de la loi du 30 Novembre 1892.

The German law is by no means so particular.

2 *Code d'instruction criminelle*, articles 43, 44, 235, et 268.

3 These rules, somewhat abridged and otherwise modified, are taken from Simon-Auteroche, "*Manuel Pratique de Droit Médical*," Paris, 1908, pp. 108-112.

parties, are not obliged to accept either the appointment or the choice,[1] but, the mission once accepted, its duties are obligatory and must be completely performed. If they are not fulfilled completely, the expert is obliged to defray all frustratory expenses, and also to pay (sometimes very heavy) damages.

2.—Expert witnesses, like common witnesses, may be challenged on grounds of relationship, affinity, etc.

3.—Experts must take a certain oath, not necessary here to be specified.

4.—Expert investigations must be conducted (when it is proper so to do) in the presence of the interested parties or those who lawfully represent them. For reasons of expediency, however, the presence of the parties may be dispensed with. But even then, the parties should have a chance to be represented by a physician, or physicians, of their choice.

5.—If several experts be chosen or appointed, they should construct but one single report. In case there should arise a diversity of opinions among the several experts, all the different opinions may be stated in detail, but no particular opinion may be attributed to any particular expert. All the different opinions must proceed from the board of experts as a whole.

Procedure of medical investigation in criminal matters.—1.—Medical experts, in criminal matters, are not invariably at liberty to reject an appointment by the court. They may do so only in certain cases.

2.—An expert may be successfully challenged, in criminal matters, much more readily than in civil affairs. "There must not be the least suspicion of prejudice or partiality, even involuntary."

3.—It is not at all necessary that the operations of the experts be conducted in the presence of the parties or of those who legally represent them.

4.—The report of the experts may, if expedient, be verbal. (It may not, under any circumstances, be verbal in a civil suit.)

5.—Medical experts must invariably be placed under oath both before commencing their investigations and, once more, before they testify in court.

Reports.—Expert reports, according to Simon-Auteroche,[2] are composed of four essential parts:

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[1] In Germany precisely the contrary condition prevails. In that country not merely an official physician, but every physician, so long as he remains in public practice, is obliged, on the suggestion of the proper authority, to act as expert either in civil or in criminal matters—unless indeed he can furnish an acceptable excuse.

[2] *Loc. cit.*, p. 112.

1.—Preamble (reciting the names of the experts, the order of the court by virtue of which the investigation was made, etc.).

2.—Statement of the facts.

3.—Discussion.

4.—Conclusions.[1]

Legal considerations regarding ophthalmic expert testimony in Germany. In Germany, too, as well as in France, there exists a corps of official expert witnesses. In Germany, however, the system is, in a manner of speaking, a "blend" of the French and the Common Law systems; that is to say, although there exists in Germany a corps of official experts, yet these do not so uniformly appear before the courts—i. e., to the almost total exclusion of non-official experts—as is the case in France. In Germany the parties have a right to propose and even to demand the summoning of non-official experts of their own naming, and, indeed, in civil cases, they may bring their own physicians with them, without so much as having made the slightest preliminary suggestion to the court.

The power to regulate medical affairs resides, in Germany, in the first instance, with the imperial authority, but these matters have, for the most part, been delegated to the separate Bundesstaaten, so that, in the different Confederated States, there obtain somewhat different systems of medical experts. However, to take the organization of the Prussian experts for an example: The head of the corps is the "Minister der geistlichen Unterrichts- und Medizinal-Angelegenheiten." Under this official functionates an "Abteilung für die Medizinalangelegenheiten," a branch of which is the "Wissenschaftliche Deputation für das Medizinalwesen," the highest consulting class. Each province has its "Provincial-Medizinal-Kollegium," each county its "Kreisärzte."

The members of this official medical corps take on the duties of expert witnesses only when called upon by the police or the State's Attorney (*Staatsanwalt*).

In addition to the system above mentioned, there are in some of the larger cities of Prussia the so-called *Gerichtsärzte*, or (law) Court Physicians.

All the official physicians in all the confederated states are appointed by the Minister for Medical Affairs (*Medizinal Angelegenheiten*) in no case being elected, or even proposed, by the public. The tenure is

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[1] We do not enter here into the question of privilege or non-privilege with respect to medical testimony in France. The subject is extensive, and may be found fully treated (if not absolutely up to date) in Brouardel's "*Le secret médical*," Paris, 1893.

for life, and all receive a yearly salary (*Jahresgehalt*). Some of the officials are allowed to engage in private practice.

An appeal lies from the report of a *Kreisarzt* or a *Gerichtsarzt* to the *Provinzial-Medizinalkollegium,* and, still further, to the "*Wissenschaftliche Deputation,*" this last-mentioned body being the highest consulting class, or, as it were, supreme court, for medical expert matters in Prussia. This, however, does not mean that the *Kreisärzte* (county physicians) and the *Gerichtsärzte* (city court-physicians) are limited to the giving of testimony in the inferior courts, such as the *Amtsgerichte,* the *Schöffengerichte,* and the *Landgerichte.* They, in fact, may testify as official expert physicians in the *Oberlandesgerichte* (which they do quite often) and even in the *Reichsgericht* itself (though, of course, not so frequently). The *Provinzial-Medicinalkollegium* may be appealed to in a *Schwurgericht* (in important criminal matters only) in an *Oberlandesgericht,* and in the *Reichsgericht;* but never except when first the *Kreisärzte* (or *Gerichtsärzte*) have already been heard in the same court. Similarly, when the *Provinzial-Medizinalkollegium* has been listened to (in any of the same three higher courts) an appeal may be taken on the medical questions involved to the *Wissenschaftliche Deputation.* The parties themselves may propose these medical appeals, but have no right to demand them. The right of decision belongs to the court itself.

Numerous forms are furnished and directions given for the construction of medical expert reports. Non-official experts are bound to follow the forms in certain matters only, while the official experts are obliged to make use of them in practically every sort and kind of case.[1]

The experts of first instance for any individual case, (other than the *Kreisärzte* and *Gerichtsärzte,* who, of course, act by virtue of their office) are generally appointed by the court. The appointees, however, can, for cause, be challenged by the accused, the complaining witness, the prosecuting attorney, and, in civil cases, by the plaintiff or the defendant. So, sometimes, may even the official physicians be challenged. In criminal cases the parties may propose, and even demand, the calling of non-official experts by the courts, while, in civil suits, the

[1] Rapmund and Dietrich recommend to non-official experts the following of official forms in every case. "*Arztliche Rechts- u. Gesetzkunde,*" Leipzig, 1899, p. 462.

By the way, those who desire to behold a combination of Teutonic scientific and legislative thoroughness in one single documentary masterpiece, are referred to the Prussian "*Regulativ vom* 14 *Februar,* 1875" (concerning the manner of performing obductions and constructing reports upon the findings) contained in the work of Rapmund-Dietrich just mentioned, p. 475 ff.

parties may, as already stated, bring their own experts with them, just as is done in this country.

Contrary to the rule in France, it is quite permissible to allow a foreign physician to testify as expert, even though he had never qualified as physician under German law. The matter lies wholly within the discretion of the trial court.

A report by a physician, or by physicians, of the first instance, is called *ein Gutachten.* One, however, that is made by either of the medical appeal bodies, is called *ein Obergutachten.*

In connection with the subject of expert testimony, it is worth while to note that, in Germany, professional secrecy is very rigidly enforced. Thus the Penal Code (*Strafgesetzbuch*), sec. 300: ". . . Physicians, surgeons, midwives, pharmacists, and any assistants of any such persons, shall, in case without authority they reveal private matters, which have been entrusted to them in consequence of their callings, be punished by a fine not to exceed 1,500 marks or by a jail imprisonment not to exceed three months."

However, in a court of law, professional secrets are, of course, legally divulgeable up to a certain extent. To exactly what extent, the law is very specific in many respects, though not all, laying down various regulations regarding non-official and official experts and also others as to official experts after these have ceased to occupy their official positions.[1]

In general, a witness is neither punishable criminally nor responsible in a civil suit for damages on account of any testimony which he may have given (veraciously, of course) on the request or demand of a court of proper jurisdiction.

Legal considerations regarding ophthalmic expert testimony in Italy. In Italy there is no corps of "experts before the courts." Any physician practising in Italy may be cited to appear and serve as an expert.[2]

It is, however, absolutely necessary that a man, in order to be competent as an expert, should be a licensed physician. He is not, nevertheless, required to be in active practice at the time of acting in his expert capacity.

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[1] Thus, for instance, the *Code of Civil Procedure (Civil-prozessordnung)* Sec. 376: "*Oeffentliche Beamte, auch wenn sie nicht mehr im Dienste sind, dürfen über Umstände, auf welche sich ihre Pflicht zur Amtsverschwiegenheit bezieht, als zeugen nur mit Genehmigung ihrer vorgesetzten Dienstbehörde oder der ihnen zuletzt vorgesetzt gewesenen Dienstbehörde vernommen werden.*" The *Code of Criminal Procedure (Strafprozessordnung)* Sec. 53, holds precisely the same language.

[2] There is, to be sure, a corps of sanitary physicians grouped in a kind of hierarchy, as in Germany; but this is an altogether different affair from a corps "of experts before the courts." This sanitary corps will be treated under the heading of *Ophthalmo-Sanitary Legislation in Italy.*

In damage suits, based on injury to special organs, the expert witness need not be a specialist in diseases of the organs concerned; nor is there any law forbidding a specialist who practises only a specialty, to render expert testimony outside his particular field.

A related matter is that an expert witness of one school of practice is allowed to testify in a suit for malpractice against a physician of another school.[1]

In criminal cases the number of experts is, as a rule, two; in civil cases, however, either three or one. In criminal cases the experts are appointed by the court (though the appointees may for just cause be challenged); in civil cases the parties agree upon their experts, or, in case of their inability to agree, the experts are selected by the courts.

All experts selected by the courts are paid from the public treasury. Those selected by the parties are compensated by the parties, except where one or more of the parties are indigent—then the public treasury is once more called into requisition.

We may add, finally, that, in criminal cases, the court has power not only to compel the experts to attend and deliver testimony, but also to prepare themselves therefor by laborious investigations.[2]

B.—Surgical Considerations Regarding Ophthalmic Expert Testimony.

The surgical side of the subject of expert testimony relates (so far as concerns the purposes of this article) to the following matters: The commonest injuries with which the ophthalmo-surgical expert witness has to deal; simulation and the tests therefor; the false attribution of injuries and diseases and the tests for that subtle form of falsification; exaggeration and the tests for that; dissimulation and cautions; visual economics; questions of a general nature relating to the power of vision and the condition of the eye after death and during sleep; the ocular signs of poisoning, burning, etc.; and, finally, the ocular indications of identity.

The commonest injuries with which the ophthalmic expert has to deal.[3] Injuries of the sort in question are: Wounds and burns of the ocular adnexa (the eyebrows, the eyelids, and the extra-bulbar

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[1] As before mentioned, only in the United States is it forbidden that an expert of one school shall testify in a suit for malpractice against a physician of any other school. Surely in this particular the law of the United States is very much in advance of that of any other nation.

[2] In the United States a physician can be required to attend a trial and to give impromptu answers both in civil and in criminal cases. He cannot, however, in either class of cases, be required, against his will, to make any sort or kind of preparation for the giving of his testimony.

[3] For a very complete discussion of ocular injuries in their strictly scientific (as well as to some extent in their medico-legal) aspects, the reader is referred to Harry V. Würdemann's *"Injuries of the Eye,"* also to the indispensable works of A. Maitland Ramsay; further, to the appropriate headings in this *Encyclopedia.*

contents of the orbit); wounds and burns of the ocular conjunctiva, the cornea, and the sclera; and, lastly, wounds of the deeper portions of the eye.

Wounds of the eyebrow are generally very simple and altogether harmless, directly and indirectly. There is swelling, perhaps, and ecchymosis, and a little throbbing pain. Resolution, as a rule, is prompt. Sometimes, however, instead of resolution, there follow periostitis, suppuration, and necrosis. Also, the outer wall of the frontal sinus may be crushed in, with resulting chronic empyema of that cavity. The supra-orbital nerve may be injured in such manner that the traumatism is followed, after a time, by persistent neuralgia. This is generally when the nerve is incarcerated in an adherent cicatrix.

It is now and then important to differentiate between contused wounds of the eyebrow and incised wounds of the same part. Such a distinction would, at first thought, seem sufficiently easy in almost every instance; yet, as a matter of practice, this is not at all the case, for contused wounds of soft parts which are underlaid by prominent bony ridges have a way of looking almost precisely as if they had been occasioned by an instrument possessed of a cutting edge. Thus, I have seen a case where a man had had his eyebrow split by a blow of a fist almost as cleanly as if the injury had been produced by a knife; yet I myself had seen the blow delivered, and was certain that nothing but the naked fist had been employed.[1]

The distinction between the apparently incised, but really contused, wound of an eyebrow, and an incised wound of the same part, is made by four indications: *First,* the wound which is really contused is more likely to possess an areola of ecchymosis. *Second,* under a lens, the walls of a contused wound are seen to be not actually smooth, but more or less ragged. *Third,* while an incised wound shows all the tissues divided just as deeply down as the wound reaches, a contused wound simulating an incised wound, shows some of the more resisting tissues, or fibres, undivided, while others, deeper down in the wound, are severed. *Fourth,* the really contused, though apparently incised, wound is generally more extensive (longer) at the bottom than at the surface, while the really incised wound is apt to possess a so-called "tail" both at the beginning and the end—in other words, to be of greater extent in the skin than in the deeper tissues. This distinction is due to the fact that, in the really incised wound, the

[1] I have also seen an elbow split by a pair of brass knucks so cleanly that, without the carefullest examination, one would almost be willing to swear that the wound had been made by the sharpest of knives.

inflicting instrument cuts from without inward, whereas, in the case of a wound of the contused variety, the incising instrument—the bone—cuts from within outward.

This distinction is often important, as, on the expert's ability to make it, not infrequently, at the preliminary trial, hinges the question whether a defendant is to be held for assault with intent to kill, or only charged with simple assault and battery. Later, the distinction and the expert's ability to make it, may mean to the accused the difference between the penitentiary and freedom.

The distinction above mentioned is similar to that (which is also very important) obtaining between an incised wound about the body almost anywhere and a wound produced artificially (artefact) by the lifting and carrying of a body which has been severely burned, or cooked. A burned body is found, perhaps in the ashes of what was once a house. Certain solutions of continuity appear in divers places about this body, suggesting the inquiry whether a murder has not been committed and then the house set fire to, in order, by incinerating the body, to cover the traces of the crime. On the other hand, the question arises whether the fissures, or apparent incisions, may not have been produced in the easily parted tissues by the lifting and carrying of the body from the site of the burning. Now, when a deep fissure is produced in burned tissues by the lifting and carrying of the body, there will often be fibers, high up in the fissure, which have not parted. Thus is easily and certainly established the fact that no incised wound had been inflicted before the body was burned; for, in case of a wound by a cutting instrument, all the tissues would be divided down to the very bottom of the incision.

Sometimes an injury to the eyebrow is complicated by suppuration of the orbital connective tissue (orbital abscess) and even though this abscess be properly evacuated, and the prospect of recovery is, for a time, apparently good, total loss of sight may nevertheless follow later, by reason of the cicatricial tissue formed in the suppurating cavity slowly contracting around the retro-bulbar portion of the optic nerve.

Fracture, direct or indirect, of the optic foramen is a not very infrequent accompaniment of severe contusions in the superciliary region; and, in such cases, a retro-bulbar neuritis (often of very slow onset) may develop, with the production of blindness more or less complete and absolutely hopeless. Secondary retro-bulbar neuritis may also occur in consequence of various effusions or of the pressure from callosities which, in their turn, have been produced by periostitis.

Fracture of the base of the skull, with meningitis and death can also occur as a complication of contusions of the eyebrow.

From all the above-mentioned considerations it appears that the ophthalmo-surgical expert should be extremely cautious when setting forth the ultimate prognosis of injuries to the eyebrow.

Burns of the eyebrow are generally not important. If other ocular structures are involved, the fact is sufficiently patent. It is often the case, however, that cicatricial contraction follows in the wake of superciliary burns, with consequent great disfigurement.

Wounds of the eyelids, without the involvement of deeper structures, are generally unimportant,[1] and, owing to the carefully protected situation of the eyes, are not common. The danger is that deeper structures may be involved. Infection, also, may turn an apparently trivial trauma of the eyelid into a matter of life and death, in consequence of the resulting erysipelas, lock-jaw, etc. Further, a wound which, on any other account, would be sufficiently trivial, may prove serious indeed if the lacrimal canaliculus be involved, because, by obstruction of this passage through the formation of cicatricial tissue, epiphora (or running of the tears down onto the cheek, instead of through the lacrimal passages into the nose) is produced, and much consequent interference with vision, on account of the continual presence of tears on the front of the eyeball. Sometimes, too, a traumatism of the eyelid gives rise, through closure of the ducts of some of the Meibomian glands, to Meibomian cysts; but these are comparatively harmless and are very easily remedied.

Burns of the eyelids are much more serious than uninfected eyelid wounds, because, after burns, cicatricial contraction may so distort the lids that they no longer fulfill the important offices for which they were provided. Thus, after a mine explosion, in which the outer surfaces of the lids were deeply burned by the flaming gas, I have over and over beheld almost incredible distortion of the lids, with ulcerating corneæ (due to the lagophthalmos) and blindness. Often plastic operations can advantageously be performed in these cases; oftener, however, operation is refused, and the mining company is likely to be held responsible for the blindness that follows in consequence of the refusal. The various entropium and ectropium operations often find a place, of course, after eyelid burns, as well as electrolysis for distorted eyelashes (traumatic trichiasis).

Injuries to the extrabulbar contents of the orbit, without a complicating injury of the eyeball itself, are quite rare, and yet they do occur. Thus, I have taken from the orbital fat a peach-tree twig two

[1] Pliny (*Nat. Hist.*, Book XI, Chap. 57) declares that, when an eyelid has been severed by a wound, it will not re-unite—a great mistake, of course. However, I have heard the same remark made by an Illinois physician in good standing.

inches long; in another case, a sliver of glass; and, in still another instance, a short ball from a 22 caliber cartridge, without in any of these cases the eyeball being injured. Various disturbances of the ocular motility can be occasioned by injuries of the extrinsic muscles, these amounting at times to complete solution in the continuity of one or more of these contractile structures. Orbital abscess is not infrequent as a result of extrabulbar orbital injuries, especially when these are complicated by the presence of foreign bodies. The great danger, of course, in such cases, is to the optic nerve, which, by reason of cicatricial contraction taking place around it, is prone to undergo atrophy. Disturbances in the motility of the eye may also be occasioned by cicatricial contraction in the neighborhood of the various muscles, or, at an earlier stage, by sloughing of the muscular tissues themselves. Suppurative meningitis is also a possible consequence, or complication, of orbital abscess.

Wounds, with or without remaining foreign bodies, and burns of the conjunctiva, the sclera and the cornea are among the commonest of injuries, and are not infrequently the ground of hard-fought litigation. An incandescent particle of iron will often inflict a wound, produce a burn and leave at the place of injury a foreign substance, all at the same *coup*. Many foreign bodies are expelled by the various provisions of nature looking to this end, while others are removed (sometimes unfortunately so, by reason of the infection introduced) through the instrumentality of fellow workmen. A fellow workman, in fact, sometimes employs his tongue as the removing instrument! Sometimes an eye is struck by a foreign body, which then rebounds away from the eye, leaving, however, a contusion of the cornea (with or without infection) and then an ulcer follows. The workman, in such cases, can hardly be convinced that "there is nothing in his eye." He has so often had a foreign body picked from his cornea, that he has come to believe that a foreign body of some kind, must, as a matter of course, be present whenever his eye is injured. Should the eye be lost, or suffer a material diminution of its vision, the patient's animosity, as well as his attempts at legal redress, are more likely to be directed toward the surgeon than toward the employing company.[1] Burns of the conjunctiva, sclera, and cornea are usually complicated by similar conditions of the lid. They are oftenest produced by steam or burning gas, but now and then take their origin from the action of chemical agents

[1] Much depends on the state of the doctor's finances. Experience shows that the number of suits for malpractice which any physician is likely to be subjected to bears a direct proportion to his financial standing. "Where the honey is, there will the flies be also," is true here as elsewhere.

(the various caustic acids and alkalies) as well as from heated pitch, water, wax, oil, and molten or solid metals, including such explosives as fulminate of silver or mercury, used in percussion caps and boys' torpedoes. They are nearly always of serious prognosis, being in many instances followed promptly by perforation of the globe. Burns by acids and alkalies (oftenest quick-lime) are likely to be not only deep but also complicated by extensive adhesions between the lids and the ball (ankyloblepharon, symblepharon, etc.). In many of the cases the surgeon can afford but little assistance. It should be recalled, to be sure, that partial symblepharon is easily cured by a simple operation. I have seen some cases of ocular burns that promised to be of the greatest severity, but which, nevertheless, gave very good results. Such was a case in which a man had filled a large hole in a base-stone with melted solder, and then, into this molten metal, had tried to set the lower end of a cold iron pillar. He was stooping close down over the stone, guiding the pillar with his hands into the solder-filled socket, when, just as the iron touched the hot solder, the metal splashed up and into his right eye. When he came to me, he seemed to be wearing a metal mask over the right eyeball. This curved plate of metal I had no difficulty in releasing from the conjunctival *cul-de-sac,* and then, behold an eyeball perfectly unharmed, except for a trifling hyperemia! The workman informed me that he had been the subject of this identical accident before, without receiving the slightest harm, and a few months later, he came to my office again with a similar mask of solder before the same identical eye. Once more I removed the metal plate, and once again, I found an uninjured eye.[1] Red pepper, too (so often thrown into the eyes on purpose) though it causes most atrocious pain, is seldom followed by any serious permanent injury.

Such exceptional matters aside, however, the prognosis in burns of the surface of the eye is always very grave, and a final opinion should never be passed till the lapse of several months. Especially after the action of quick-lime or fresh mortar, and the fulminates of silver and mercury, should the prognosis be extremely guarded.

The *iris* is not infrequently involved in wounds of the eye, whether the ocular coats have or have not been opened. In severe contusions (produced, for instance, by a blow of the fist, or a hard snow-ball) the iris is now and then detached at its circumference more or less completely. An incomplete detachment is known as *iridodialysis;* a complete one, as *irideremia,* or *traumatic aniridia.* Detachment is much

[1] Noyes. *Diseases of the Eye,* 1894, p. 288: "Burns by melted metal are often less severe than those due to lime, because when the metal cools it is taken out as a cup, and there is no continuously destructive chemical action."

more likely to occur in the case of irides already adherent to the lens, or the subject of inflammation at the time when the contusion was inflicted. Hence, the prospective expert witness should always enquire carefully as to the existence of these predisposing causes. If the crystalline lens has been dislocated backward (sometimes without such dislocation) the iris may suffer inversion (retroversion, or retroflection)—a condition which often closely simulates iridodialysis and irideremia. The distinction is easily made by the fact that, under the ophthalmoscope, the ciliary processes will, in retroversion, be found to lie concealed, but not in iridodialysis or irideremia. In the latter two conditions, further, there is much more likelihood of considerable hyphemia being present on account of the necessarily ruptured iris tissues.

Rupture of the sphincter iridis without iridodialysis or irideremia, is rare indeed, but has occurred a number of times. It is apt to be accompanied by hyphemia, and is always attended by traumatic mydriasis.

Traumatic mydriasis without rupture of the sphincter iridis, is not uncommon, and is due to paralysis of the sphincter iridis.

All of these affections (except traumatic mydriasis without rupture, which now and then disappears spontaneously) are absolutely incurable.

The loss of earning power consequent upon any of these iris injuries can only be determined in any particular case by actual investigation. Sometimes, even after complete traumatic aniridia, the vision is but very little disturbed; again there may be monocular diplopia, dazzling, etc., those who work much in the dark—e. g., coal miners—are least inconvenienced. If severe iritis or irido-cyclitis follows, the sight may be entirely lost.

Liable to be mistaken for the results of trauma, are the following natural anomalies of the iris:

Heterophthalmos, or difference in the coloring of the irides of the two eyes. I have known such a condition to give rise to a mistaken diagnosis of traumatic iritis.

Corectopia, or *ectopia pupillæ,* or malposition of the pupil.

Polycoria, or more than one pupil in the same eye.

Persistent pupillary membrane, or fetal remains which present themselves ordinarily as fine grayish or brownish threads stretching from iris to lens, or spanning the pupillary gap completely. Such threads are now and then mistaken for posterior synechiæ, but can easily be distinguished from such pathological products by the fact that, unlike posterior synechiæ, they do not spring from the pupillary margin but from a point a little farther out than that, from some point,

in fact, on the *circulus iridis minor* on the anterior surface of the iris. Posterior synechiæ spring either from the margin of the iris or from its posterior surface. Another point of distinction is that under atropin, these threads, or bands, prove to be very elastic; the pupil, in spite of such threads, dilating quite smoothly and round.

Congenital coloboma of the iris is very often mistaken either for an artificial coloboma, or else for a retroflection, or retroversion, of the iris, due, of course, to trauma. In a congenital coloboma, however, the sphincter iridis continues into and round the gap unbrokenly, whereas no sphincter appears in a coloboma due to traumatism or in the gap produced by a folding backward of the iris. Further marks of distinction are: A congenital coloboma is almost always situated below (though exceptions to this rule exist); and, moreover, a congenital coloboma is often, perhaps usually, associated with coloboma in the choroid, the ciliary body and the lens.

A special importance attaches to the differential diagnosis between a congenital coloboma of the iris and an artificial coloboma, or a retroflection, from the fact that eyes afflicted with congenital coloboma are very often partly, and sometimes completely, blind. Therefore, a claimant might readily attempt to attribute to traumatism what was, with him, a natural condition.

Foreign bodies in the anterior chamber and in the iris, usually enter by way of a perforation in the cornea; in very rare instances, they enter sidewise (*via* the lens perhaps) or from the rear. Whether in the iris or the anterior chamber, their presence may be tolerated indefinitely, but, as a rule, they sooner or later set up a low grade inflammation which gradually spreads to the ciliary body and the other intraocular structures with resulting intraocular abscess, or, more frequently, ocular atrophy. The worst feature of such cases, however, is the tendency toward the setting up of sympathetic ophthalmia. Without extraction of the foreign body, prognosis is always grave.

The choroid and the ciliary body when injured, whether or not a foreign substance is left within these structures, present perhaps the most serious conditions with which the ophthalmic surgeon is called upon to deal. Even a slight contusion upon the eye may cause a hemorrhage from the structures (especially in anemic persons, or those who are suffering from arterio-sclerosis or high degrees of myopia) and the extravasated blood may collect between the choroid and the sclera, or else, which is much more serious, between the choroid and the retina. Sometimes the hemorrhages are slight and promptly absorb. In such cases the vision does not suffer. Oftener, however, the choroid is detached, or the retina, and then the eye is almost invariably

lost—in the former event from irido-choroiditis, and in the latter, from the tendency which any detachment, however slight, of the retina, displays, to become complete.

Ruptures of the choroid are generally situated between the optic disk and the macula lutea. In the simpler cases, the vision, which immediately after the injury is nearly always bad, rapidly improves, but scotomata are nearly always left permanently, and a perfect result is the very rare exception. In the graver cases, the sight is nearly always permanently lost, owing to detachment of the retina, hemorrhage into the vitreous and other complications.

Perforating wounds of the ciliary body, if they lie in a direction parallel to that of the ciliary folds, are often of good prognosis; if, however, they lie diagonally across the folds, or transversely, the eye is generally lost by atrophy, and there is in such cases a marked tendency toward sympathetic involvement as well.

In case a foreign substance is left in the ciliary body, the prognosis is, of course, even graver.

The *retina* alone is hardly ever injured, for penetrating wounds of this membrane of course involve some of the other structures necessarily; while even a rupture of the retina, produced by a contusion, is likely to be accompanied by solutions of continuity in the choroid. Retinal ruptures produced by contusions nearly always occur by *contre-coup.*

The slightest of all the injuries of the structure in question is known as *commotio,* or *concussio, retinæ.* The retinal changes which are designated by this name have been mistaken for retinal detachment, and, as they nearly always undergo perfect resolution and that very quickly, they are hence important in a legal viewpoint. The distinction between concussion and detachment is made by the following signs: In concussion the retinal vessels are wholly undisturbed, showing no parallactic movement or increased hypermetropia, the opposite state of affairs presenting itself in retinal detachment. Further, in concussion, the retinal plications, or folds, occurring in detachment, are absent. Finally, a concussion (which is always recent) is never quite so white or so opaque as a recent retinal detachment.

Other forms of retinitis than the relatively unimportant *concussio,* are far more serious. Such, for instance, are the *retinal changes at the macula lutea,* neither commotio or detachment, following contusions of the globe and nearly always serious and permanent. In fact the visual disturbance, being macular, is well-nigh always incapacitating, so far as the earning power of the injured eye is concerned. An important matter to remember is that the changes in question are of very

slow development in the vast majority of cases, weeks being required in some instances before the visual difficulty appears. In such cases, of course, the question often arises, especially in court, why was it that, if the eye was so severely injured as is claimed, the plaintiff did not observe the fact until several weeks after the accident—until, indeed, other persons perhaps had found it possible to recover for *their* injuries received at the same place and at the same time?

Hemorrhage confined to the retina is generally of little import permanently. There is often for a time, especially if the bleeding be central, erythropsia and metamorphopsia. Whether central or not, a hemorrhage is almost always accompanied by a scotoma. These appearances, however, provided the extravasated blood does not break its way into other structures, are very evanescent.

Detachment of the retina, however, may occur in consequence of large effusions of blood, though oftener by far it is produced primarily by contusions or perforations of the globe. Occasionally the retinal separation is consequent (at a late date) upon the contraction of cicatricial tissue, either in the vitreous or in the retina itself. Extensive loss of vitreous is not infrequently responsible for its production. The amount and kind of visual disturbance depend, of course, upon the extent and situation of the retinal detachment. Contraction of the visual field and scotomata correspond pretty closely to the portions of the retina that are detached, and metamorphopsia (distorted vision) together with erythropsia (red vision) in the case of hemorrhages, is apt to precede the formation of the blind areas, and to diminish *pari passu* with the increasing blindness.

Prognosis is always bad, although traumatic detachment of the retina is oftener followed by complete recovery than are the other varieties.

The *crystalline lens,* as a result of traumatism, may undergo displacement (luxation or subluxation) or be rendered opaque (traumatic cataract) or become the seat of a foreign substance. Luxation, partial or complete, may be the result of a penetrating or rupturing wound of the eyeball, or merely of a contusion or compression of the eye. It is said to have happened as a result of concussion sustained by the skull, and even by the neck and the feet (as in falls from a height). Even in partial dislocation there is loss of accommodation and sometimes monocular diplopia. In backward dislocations, the iris becomes tremulous (iridodonesis) by reason of loss of the normal support which is afforded the iris by the lens. In case the lens is so displaced as to lie with its margin across the pupillary area, one part of the eye may be extremely hypermetropic and the other myopic. Complete disloca-

tion into the vitreous means, refractionally at least, aphakia (as after a cataract extraction) hence an extreme degree of hypermetropia—unless, indeed, the eye was very myopic to begin with. In some cases of partial dislocation, the diagnosis can only be made after atropinization and then by means of the ophthalmoscope. Forward dislocations are sufficiently obvious even to beginners in ophthalmology.

It should be remembered that displacement of the lens is now and then congenital. Thus, P. H. Adams, of Oxford, England, reports the case of a family with congenital displacement of the lenses, in which the mother and seven out of nine children suffered from this condition.[1]

Partial dislocations can sometimes be remedied, though never fully, by means of spectacles. Even then, however, the great difference in the refraction of the two eyes (anisometropia) renders impossible the simultaneous employment of both organs, and hence the victim of the accident is rendered monocular to all intents and purposes, except that he possesses in the vision of the injured eye a moderate reserve of sight to draw upon in case the fellow organ should go blind from any cause at some time in the future.

Complete dislocation into the vitreous does not call for extraction, or other form of operation, unless productive of irritation. Glasses prove of benefit in this condition under the same conditions, as a rule, as in partial dislocations. Complete dislocation forward—i. e., into the aqueous, is so often followed by chronic glaucoma, lenticular opacity (cataract) and adhesions to the iris and cornea that, in the great majority of cases, extraction of the lens is necessary. In any case of dislocation of the lens, forward or backward, partial or complete, the lesion is apt to be followed by lenticular turbidity (cataract). This may render operation necessary at a later date.

Traumatic cataract without lenticular dislocation is often a consequence of injuries to the eye, accompanied or unaccompanied by perforation or rupture of the ocular tunics. If entirely uncomplicated, these cases can usually be conducted to a successful termination (the younger the subject the greater the probability of success) so far as respects the injured eye alone. However, the eye can never be employed to advantage simultaneously with the fellow organ, excepting only in the extremely rare instances where the fellow eye was already aphakic or extremely hypermetropic.

A foreign body in the crystalline lens means, as a rule, progres-

[1] Report of June meeting of the Ophthalmological Society of the United Kingdom, *Medical Press*, June 25, 1909, abstracted in *Ophthalmology* for Nov., 1909, Vol. VI, No. 1, p. 105.

sive opacity of that structure. A wide pupil and oblique illumination are often prerequisite to the discovery of the intruding substance. In my experience, small foreign bodies in the lens, if not amenable to a magnet, are better left alone, for, now and then, the expected cataract never develops, and the patient retains an extremely useful organ, whereas, if necessary, operative interference can be instituted at a later date. Much depends, of course, upon the extent of the injury suffered by the lens, and on the character (as regards probable asepsis, etc.) of the offending substance.

Wounds of the vitreous humor are not as a rule important, except so far as they imply an injury to other and more irritable structures—the retina, the choroid, etc. In other words, simple compression or contusion of the eye, seldom results (owing to the elasticity of the vitreous) in serious injury to the vitreous humor, excepting when a hemorrhage from the coats of the eye, breaks through the limiting membrane (hyaline membrane) or when an exudate is poured out into the vitreous from the ocular coats. In cases of hemorrhage into the vitreous, the outlook, though not hopeless, is bad. I have seen in young patients, after moderate hemorrhage, complete recovery in every portion of the field; but, in the vast majority of cases, positive scotomata, movable or immovable, remain, impairing the sight and earning power according to their extent and to the parts of the visual field to which they correspond. In cases of exudate, connective tissue bands are formed in the vitreous, and these, contracting, cause detachment of the retina and choroid, together with atrophy of the eyeball.

When the coats of the eye are perforated, hemorrhage and exudate into the vitreous are far more likely to occur, together with retinal and choroidal detachment, and, in addition, there may occur an intraocular abscess. Prognosis depends on the site of the injury, the presence or absence of infection, the quantity of exudate or blood poured out, the amount of vitreous which has escaped from the eye, and, finally, on the presence or absence of a foreign body.

Foreign bodies in the vitreous may arrive in that humor after a journey through almost any part of the enveloping membranes. Perhaps most frequently they pass through cornea and lens; often, however, through sclera, choroid, and retina. They consist, for the most part, of bits of metal and stone, but particles of coal, wood, and other substances have often been found in the vitreous.

Diagnosis is often difficult. There may manifest themselves at once by scotomata and peripheral contractions. Sometimes the path which has been taken by the offending substances can be discerned, either by the naked eye (lateral illumination should be employed) or by means

of the ophthalmoscope; this, again, may be impossible, owing to a great variety of circumstances. Sometimes the ophthalmoscope reveals the foreign body with much distinctness, often, however, the quantity and situation of the hemorrhage forestalls even the haziest kind of view. Air bubbles in the vitreous are highly suggestive, but not absolutely pathognomonic, for they may occur even when the coats of the eye have not been perforated. Magnetic needles have been devised for the purpose of detecting the presence of metals which, like steel and iron, exert an influence upon magnetic substances. The giant magnet is, with regard to such particles, both an excellent means of diagnosis and a splendid instrument for removal. In very many cases, too, the X-ray gives valuable information; in fact this agent, in a very large number of instances, is undeniably our most reliable means for the detection of foreign substances in the eye. A decided advantage is that many substances not susceptible to magnetism (and therefore not responsive to the needle and the magnet) are very plainly revealed by it—for instance, certain kinds of glass,[1] though unfortunately, not wood. For the technique required when magnetic needles or the X-ray is employed for the purpose of detecting foreign bodies in the eye the reader is referred to the appropriate portions of this *Encyclopedia.*

The foreign body should, when possible (especially if possible without too great disturbance of the intraocular tissues) be extracted. In no case, however, should the operator merely go "a-fishing" in the eye. In the case of substances susceptible to the action of magnets, such a removing instrument may be employed at times with very conspicuous success. In any case, however, even after the apparently successful removal of the foreign substance, the prognosis should be guarded, for, even in such cases, there may follow such cicatricial contraction that the eye, after a time, is absolutely worthless. If the foreign body is septic in character, the eye is nearly always lost, whether the foreign body is or is not successfully extracted.

Suppose the foreign body is allowed to remain within the vitreous. What, then, is the prognosis? If the body be septic or oxidizable, the eye is lost almost as a matter of course. Sometimes, on the other hand, aseptic and non-oxidizable foreign bodies in the vitreous, are tolerated indefinitely, with or without encystment. As a rule, however, even bodies of this class sooner or later occasion iritis, cyclitis, and a plastic form of hyalitis, followed by contraction of the bands of exudate, and then sets in detachment of the retina, with, perhaps, a

[1] Depending on the chemical composition of the glass. Tivnen (*Ophth. Record,* xxiv, 12, p. 640) says: "Generally speaking, the localization of glass in the eye by the X-ray is very disappointing."

shrinking of the eyeball. The general health may suffer, and, as a last chapter in this melancholy history, there may follow sympathetic ophthalmia.

For the amount of damage done to the earning capacity by the various forms of ocular injury, the reader is referred to a later section of this division, entitled *"Visual Economics."*

Simulation of ocular injury or disease.

By *simulation* we understand the feigning of an ocular injury or disease which does not at all exist; by the *false attribution* of an injury or disease, the assignment to an actually existent disease or injury of an untrue cause; by *exaggeration,* finally, the pretense that a certain injury or disease which does actually exist (whether the cause assigned be true or false) is of greater extent or severity than is really the case.

Closely related to these is *dissimulation,* or the pretense that an actually existent disease or injury does not exist.[1]

All these forms of falsification, excepting the last-named only, either with regard to the eyes or to other organs, are very common—a fact that has been stated in almost every work on legal medicine with such a fullness of detail that the subject has actually been worn threadbare. However, to exemplify briefly with regard to the eye and with respect to simulation only: School children attempt to escape from their school room duties by pretending that their eyes are painful.[2] Soldiers and sailors seek to avoid military service by pretending blindness, partial or complete, in one or both eyes. Pensioners have been known to simulate. Hysterical people, in order to excite either wonder or pity, often feign blindness. Finally, workmen in factories and mines, and passengers on, and employes of, railroad and steamship lines, often endeavor, after an accident, to produce on the mind of the examining expert the impression that their eyes are injured, though not the slightest harm has really been produced.

Of all the diseases of the eye which are feigned absolutely, i. e., simulated—where the lie is, as it were, "made out of whole cloth"—the commonest are amblyopia and amaurosis. Next to these comes kopiopia, or the rapid exhaustion of vision; and, finally, there come concentric contraction of the visual field and scotomata. These four

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[1] Simulation, false attribution, exaggeration, and even dissimulation have all been enormously increased in Europe, and to some extent in the United States, since the passage of the various "Workmen's Compensation Laws." For a notice of such laws, see, under the names of the different countries, the division of this section entitled, *"Ophthalmo-Sanitary Legislation."*

[2] The Germans have a word *Schulkrankheit,* by which they designate any feigned illness.

troubles, of course, when actually existing, can be exaggerated also, but, owing to the precision with which the condition of the visual apparatus can at the present time be determined, it is practically impossible to simulate any other affections of the eye than just these four. Almost all other diseases must show some actual pathological changes, in which event, of course, there is possible, in the way of falsification, merely exaggeration or else the assignment to the pathological condition of an untrue cause.

Tests for the simulation of concentric contraction of the visual field and scotomata.—This sort of simulation, though very rare indeed, has yet been known to be practised. The commonest form is that in which it is pretended that there is mere concentric contraction of the field. The contraction is generally feigned to be of high degree, as otherwise the injury to the earning power would be too slight to constitute a ground for heavy damages. The very existence of central scotomata, ring-shaped scotomata, and hemianopic defects, is wholly unknown except to experts. Possibly an expert might hope to simulate defects like these with a moderate chance for success. Expert or layman, however, the claimant should be examined on various days, or at least occasions, and the separate results should be written down and carefully compared. By taking the size of the field as a whole, and also the size of the various scotomata (if any are alleged to be present) at various distances, almost any malingerer with regard to the matters in question, can surely be exposed. It should be remembered, however, that in cases of hysteria (an affection that is often alleged to be of traumatic origin, as after a railway accident) the contraction of the field and the various other scotomata do not remain the same throughout the test, even in genuine cases.

Tests for the simulation of kopiopia.—Kopiopia is almost always due to errors of refraction, to paresis or paralysis of the ciliary muscle, to various affections of the extrinsic muscles, or to neurasthenia or hysteria. In all such cases, of course, the physical signs of the various disorders mentioned will be present, and there can be but little chance of error. Sometimes, however, rapid exhaustion of the eyes does really occur as an isolated symptom, and then the question of malingering or no malingering is very hard to answer. Repeated testing, from the nature of the affection, is of very little use. Continued observation is now and then serviceable; but, occasionally, actual detective work should be resorted to by those in charge of the defense. Sometimes a little investigation of this kind discloses wonderful matters. For instance, it may show that the supposedly kopiopic person is spending a considerable number of his hours in writing or reading. Again, a

simulator may at times, for an attractive wage, consent to copy fine print for many hours daily, or nightly, especially if the place of working is such that he believes he will not therein be subject to damaging observation.

Tests for the simulation of amblyopia and amaurosis.—Where amblyopia or amaurosis is feigned, the affection is almost always declared to be unilateral; nevertheless, for the sake of convenience, we shall treat first of the very rare instances where blindness is alleged to exist in both eyes. We depend, in such cases, very largely on the presence or absence of the pupillary light-reaction. If the pupil acts quite well to light, the claimant is probably malingering. However, a word of caution is necessary as to this, for, in a very few instances of actual amaurosis (i. e., where the lesion is situated high up in the optic tract) the pupillary light-reflex is retained unimpaired. On the other hand, one should always bear in mind that cases exist in which the pupil does not react to light, though light perception is present. Then, too, some persons possess the power of contracting or dilating the pupil at will, while, finally, the presence of posterior synechiæ accounts for the immobility of some pupils.

The way in which the pupillary light-reaction should be tested is this: The claimant, by ordinary diffuse daylight, is caused to face directly a window, and to gaze at a distant object, the while he holds a hand across the eye that is not under examination, in order to exclude the light therefrom. The examiner then first notices the size of the pupil in the eye that is being tested, and then excludes the light therefrom (by holding a hand across it) for as long as five or six seconds. On removing his hand, the examiner will find, in case the light-reflex is normal, that the pupil has considerably enlarged. The enlargement, or dilatation, remains for about half a second, and then is followed by a very decided contraction. This contraction is succeeded by a moderate dilatation, and that by a still more moderate contraction, until at last the pupil becomes stationary in a condition of more or less moderate contraction, according to the intensity of the ilumination. By the rapidity and the amplitude of these pupillary excursions the examiner decides as to whether the light-reflex is normal or abnormal.

All the conditions of the test, however, as above laid down, should be carefully complied with. Thus, if the examinee stands with his back, instead of his face, toward the window, the illumination may not be sufficient to affect the pupil visibly, even if the light-reflex be normal. Again, if the eye that is not under examination be not excluded from the light, the illumination that enters that eye will affect the pupil of the fellow organ through the so-called "consensual" light-reflex. Still

further, if the examinee's gaze be not directed at a distant object, then the contraction of the pupil which results from, or at least accompanies, convergence and accommodation, will suffice to confuse the examiner.

To exclude the possibility of error through posterior synechiæ, the pupils of both eyes should be subjected simultaneously first to high and then to low illumination. In proper cases (i. e., in young subjects and where there is no suspicion of glaucoma) atropin may be resorted to, and is generally conclusive.

Then, too, there are other tests. Dilatation of the pupils being an almost constant result of amaurosis, the absence of this symptom is exceedingly significant. True it is that dilatation can be produced artificially, e. g., by means of atropin or cocain; but such a factitious mydriasis can easily be detected by the fact that, in nearly all such instances, the mydriasis is nearly or quite *ad maximum*. Complete dilatation *ad maximum* would indicate the combined employment of atropin and cocain.[1] Shrewd malingerers often use a weak solution of the drug, or defer the appearance for examination until the pupillary dilatation has somewhat subsided. *Schmidt-Rimpler's test* for the simulation of bilateral amaurosis is this: The examiner directs the patient to look at his own hand. A malingerer, especially if ignorant, will now and then look purposely elsewhither than at the hand, although, as a matter of fact, a person who has been blind, whether for a short time or for a long one, experiences no difficulty whatever in fixing either of his hands with the visual axes. The Schmidt-Rimpler test has been somewhat modified by Burghardt, who suggests that the claimant be requested to put out the forefinger of one hand, and then touch that finger with the forefinger of the other hand. People actually blind, experience no difficulty in doing this. Quite important as a test for amaurosis (especially if declared to be of long standing) is the staring, fixed, unmeaning, look of the eyes, which is very soon acquired by those who are truly blind, and with which the experienced oculist cannot help being familiar. Not quite so important, and yet of some significance (because more likely to be overlooked even by a coached malingerer) is the short-stepping of the truly and totally blind, together with the upward turning of the face, and a generally "listening" expression. Repeated tests made with test-cards ending in lines of different-sized type on the different days, or occasions, of testing (*e. g.*, Snellen 40 on one occasion, Snellen 20 or 10 on another) will now and

[1] "The mydriasis produced by the simultaneous action of atropin and cocain is the most considerable that can possibly be attained."—Fuchs, *Text Book of Ophthalmology*, New York, 1893, p. 259.

then suffice to expose the simulation of bilateral amblyopia, the malingerer believing that, on each occasion, he should, to be consistent, leave off reading at exactly the same number of lines from the bottom of the card. Further, it is always a ground for the greatest suspicion when the claimant, in reading aloud the test type, declares that he can read no further, although, thus far, he has made no mistake in identifying letters. A strictly honest reader will almost invariably miscall the hardest letters (for instance B and S) in one line, before declaring his total inability to read any of the letters of the next. Again, if he miscalls only certain letters in a line, and these are the easiest letters in that line (for instance T and L), this is also ground for some suspicion. However, it should be remembered that even ordinary patients, who, for instance, are being tested for glasses, will now and then abruptly stop and declare their inability to read further, though, up to that moment, they had not miscalled a single letter. In the case of such patients, however, repeated urging will invariably bring about the reading of still finer lines of type and the customary irregular and gradual, instead of sudden and even, fading away of the power to read on. It is also well enough to note that the influence of astigmatism should be excluded before the failure to read easy letters while harder ones are recognized, should be regarded as suspicious. Not infrequently (in the case of unskilled malingerers, who, of course, constitute the largest class) the replies of the examinee, while he is being tested, are manifestly absurd. For example, he may allege that a weak lens, or even a flat glass, improves his vision greatly, or "magnifies" the letters very much. A + 1.00 D. S. "seems to feel good" to the eye, while a + .50 D. S. causes extreme pain. Threatening movements toward the claimant (accompanied by the greatest caution neither to make a noise nor to set in motion a current of air—noises and air-currents often alarming patients truly blind) will occasionally throw a claimant off his guard; and, in one instance, I detected a malingerer merely by "making a face" before him—the suddenly altered expression of the claimant's countenance being quite sufficient evidence that he had seen. A peephole through which the alleged amaurotic subject can be observed from a neighboring apartment is often an instrument of scientific precision, if not of dignity. Sometimes, from such a coign of vantage, the claimant will be observed to take up books and papers, and examine them critically. In very many instances, however, nothing suffices but protracted observation, especially in cases of simulated amblyopia, in which condition, of course, the presence or absence of mydriasis and the presence or absence of the pupillary light-reflex are very much

less to be depended on as tests for malingering than in cases of simulated amaurosis.[1]

Finally, it should always be borne in mind that the mere allegation of amaurosis or amblyopia is in itself a suspicious circumstance (particularly if unaccompanied by evidence of renal alteration) for the very simple fact that blindness, partial or complete, non-congenital, not due to refractive errors, or corneal, aqueous, or lenticular obstructions, and, furthermore, presenting no ophthalmoscopic changes whatever, is exceedingly rare. Occurring in connection with a claim for damages, an allegation of blindness, without the presence of a single supporting objective symptom, is a proper ground for suspicion of very high degree.

The simulation of unilateral amaurosis and amblyopia is very much easier to detect than is the bilateral variety of simulation, although (as has been stated *supra*) it is much more commonly practised. The following methods of detection have been chosen by the present writer as being of especial value in legal cases.[2]

The method of Cuignet.—Direct the claimant to read, at the same time to hold quite still both his head and the reading-matter. Insert a pencil vertically between the eyes and the book. If the patient continues to read uninterruptedly, he is undoubtedly seeing with both eyes, because, did he not see with one eye such letters as were quite invisible to the other (on account of the pencil intervening between that other eye and those letters) he could not read them. This test is by no means infallible, being absolutely worthless, indeed, in the case of all malingerers who have been thoroughly coached about it. Such malingerers can easily refuse to read all such words, or portions of words, as are overlaid by that particular "ghost-pencil" (there are, of course, two of these) which stands on the side of the sound eye. Further, the examiner must, in any case, be absolutely certain that both the claimant's head and the reading matter are kept absolutely unmoved. Otherwise, a claimant may seem to be malingering when, in fact (by moving his head or the book a trifle) he is really doing his best to read across the page continuously. A page consisting only of letters unrelated in sense is preferred by some examiners, for the reason that when such a page is employed, an innocent examinee will not be able

[1] In fact, simulated bilateral moderate amblyopia is the hardest kind of important ocular malingering to expose.

[2] A rather large number of tests should be familiar to the expert, because some tests may easily enough be rendered useless by reason of the claimant having been very thoroughly coached concerning them. Also, the expert can better withstand a cross-examination when he has used a considerable number of methods.

to appear guilty, merely by being able to guess that the words, or parts of words, are, which, to him, are really covered by the pencil.

One of the best points about this test (legally considered) is that it can be easily understood and even repeated to his own satisfaction by the average juryman.

The method of Alfred Graefe.—Have the claimant hold the professedly bad eye closed. Then set before the sound eye a prism in such a position that the thick edge thereof extends horizontally across the pupil. The claimant, of course, sees double—a fact he will readily admit, because, so far, the professedly unseeing eye has not been called in question. Then let the claimant uncover the "unseeing" eye, at the same time that the examiner slightly moves the prism in such a way that the sound eye cannot now possibly see double. If the patient still sees double, he is seeing with the eye which he before declared to be blind. The prism employed in this test must of course be strong enough (say 10°) to insure that double vision will necessarily result after the second eye has been uncovered—assuming, of course, that the second eye is possessed of sight.

This test has an especial advantage in that, unknown to the claimant, the visual acuity of each eye can be accurately determined. This is accomplished by having the claimant read aloud first one, then the other, of the twin images. It can also be understood by a fairly intelligent juryman.

The test is also carried out in an even simpler form. The examinee is permitted to look with both eyes. The physician places a 10° prism, base up or down, before the sound eye, and, if the claimant admits to seeing double, he is seeing with the alleged blind eye, as well as with the sound one. The difficulty is, however, with this simplified form of the test, that the claimant, because his alleged blind eye is manifestly under examination, will not invariably confess to seeing double. He is much more likely to do so with the test in the regular form.

The crossed diplopia test.—This also is a test carried out by means of a 10° prism. Place the prism, base out, before the alleged blind eye. If that eye sees, it will make an excursion inward, involuntarily, for the sake of single vision. Of course, if it does not see, it will not perform this movement. This test is easily demonstrated to the average intelligence.

Method of Vieusse.—On a plain stereoscopic card are fastened two wafers of different colors—one red, for instance, and the other blue—at a distance in the case of each wafer, of ½ centimeter from a vertical line dividing the card into halves. When so small a distance—only 1 centimeter—separates the wafers, the wafer which is on the right

side of the card appears, when the card is looked at through a stereoscope, to be on the left, and the wafer which is on the left half of the card appears to be on the right. The card is placed in a stereoscope, and the instrument handed to the claimant with the request that he look at the card through the instrument and inform the examiner as to what it is that he sees. If he admits that he sees both wafers, then, of course, he is seeing with both eyes. If, on the other hand, he confesses to seeing one wafer only, he is asked to state the color of that wafer. He will almost certainly, if malingering, name the color of the wafer which appears to be on the side of the sound eye. By so doing, he of course, unmasks himself completely, for the wafer that appears to be on the side of the sound eye is the one which is seen by the eye that he alleges to be blind.

Perhaps a better way is to have a horizontal line on one of the halves of the card, a vertical line on the other, these lines occupying such positions that, when seen through the stereoscope by a pair of sound eyes, they appear to form a cross. If, then, a person really blind in one eye, looks through the instrument at this card, he will see either the horizontal line only, or else the vertical line only. If he admits to seeing a cross, he is malingering, of course. Any juryman can understand this test.

The method of Harlan.—Have the claimant cover with his hand the alleged unseeing eye. Place before the sound eye a + 6.00 D. S. glass. This eye is now artificially myopic, and can read (assuming that the eye is emmetropic naturally) fine print at a distance of 6½ inches at the very farthest. Place a card of fine type very close to the eyes, and have the claimant release the injured organ. Ask him to read aloud, and then, as he does that, slowly remove the card from the eyes, until a distance greater (to be perfectly sure, some inches greater) than 6½ inches, is intervening between the claimant and the card. If the claimant still reads, he is doing this solely by means of the eye which he had previously declared to be blind.

This test is also employed in a slightly different way. The claimant, when the test is applied in this modified form, is not requested to cover the alleged bad eye at all, but, at the very outset, there is placed before both his eyes a trial frame containing a + 6.00 D. S. lens for the sound eye and a flat glass (or, what amounts to the same thing, a + .25 D. S. lens) for the other. The claimant is then requested to read the distant types. Believing that he has about the same sort of glass before each eye, the examinee very often proceeds to read, thus, of course, demonstrating the fact that he is seeing with the eye which he alleges to be blind.

By the suppression of technicalities, this test can be made very clear to the average jury.

Method of Jackson.—Place before the eye supposed to be blind a + 4.00 D. S. lens and before the sound eye a + 2.00 D. S. The *punctum remotum* of the first eye will now be 25 centimeters; of the other, 50 centimeters. Hand the claimant a card of fine type, and ask him to read. If he selects as his reading distance 25 centimeters, instead of 50, he is malingering. A good, court-proof test.

Method of Snellen.—This method requires the possession of test-types alternately red and green upon a black ground, and a pair of spectacles in which one glass is green, the other red. Through the red glass only the red letters, not the green, are visible; and correspondingly, through the green glass, only the green letters and not the red ones, can be discerned. If the claimant reads all the letters indiscriminately, he is reading with both eyes. A test that is promptly and universally intelligible and even demonstrable.

Method of Nettleship.—Instill one drop of a 2 per cent. solution of atropin into the *sound eye*—preferably after cocainization. Then bandage *both* eyes for one hour. Place in the claimant's hand a card of fine type, remove the bandage, and request him to read aloud. If he reads, he accomplishes that feat by means of the blind eye. This is theoretically an excellent test, but, in practice, I have found it difficult of employment, because the claimant not infrequently objects to having "medicine" put into his sound eye. Hematropin I have also found much preferable to atropin, because, the claimant being naturally somewhat hostile to the examiner, is apt to view with much alarm the week of actual blindness in the sound eye resulting from the use of atropin. There is also ever present, whether homatropin or atropin is used, the remote possibility of relaxing in this, the sound, eye a long-existing spasm of the ciliary muscle covering a high degree of hypermetropia, and then of the spasm not returning when the otherwise transitory effects of the atropin have passed away. In such a case, of course, the hostile claimant can hardly be convinced that he has not been seriously injured in the sound eye by the examiner, and a suit against the examiner in which the defendant in the original suit (or claim) may or may not be joined (according to whether he can or cannot be regarded as a principal, under whom the examiner was acting as agent) may follow. In any case, to use this test successfully, the examiner must make sure (preferably after the claimant has admitted his ability—or denied it—to read) that relaxation of the ciliary muscle in the sound eye and consequent inability of that eye to read fine type has actually occurred.

None of the numerous tests for malingering which require the use of complicated apparatus (such as Worth's) or a deep understanding of optical principles, possesses half the value in a law court of a simple and generally intelligible test, such as any one of those above described. A juryman feels on surer ground, when he understands precisely how the fraud in question was exposed.

In addition to these more particular methods, almost any one of which will suffice in the vast majority of cases, the state of the pupil as to light-reflex and dilatation should be carefully interrogated. And, by the way, when testing the light-reflex in a case of alleged unilateral amaurosis, we should never forget to examine the consensual light-reaction, since this is a means of determining whether the non-response to light in the pupil of the alleged bad eye is, or is not, due merely to posterior synechiæ. The way in which to test the consensual light-reflex is this: The pupil of the eye to be tested is alternately exposed to and excluded from the light, while the effect of so doing is watched in the second eye. If the second eye (being itself healthy) does not respond to the alternate screenings and exposures of its fellow, then the absence of the light-reflex from that fellow eye is not due to posterior synechiæ. It is to be observed that, in unilateral simulation, as well as in bilateral, the malingerer not infrequently resorts to the factitious mydriasis producible by means of atropin or cocain. In this connection it should be remembered that, when only one eye has been atropinized, the pupil of the other eye is narrower than normal, because of the consensual light-reflex being excited unduly by means of the unaccustomed quantity of light which enters the atropinized eye. Sometimes the pupil of the second eye is found abnormally enlarged, because of some of the atropin solution (or at times even some of the tears from the atropinized eye) having been inadvertently introduced into the admittedly sound eye. The admittedly sound eye may also present a dilatation due to the fact that so much of the atropin solution has been used in the professedly amaurotic eye that the general effects of the drug (which include, of course, a dilatation of the pupils of both eyes) have been evoked. In unilateral malingering, however, as well as in bilateral, it may, in case the claimant be a man of shrewdness and understanding, become absolutely necessary to resort either to espial or to protracted observation—the claimant, after a few weeks, or while away on a visit, neglecting to keep the pupil of his "blind" eye dilated. Threatening motions (care being taken, as before, to guard against the production of noise and air currents) and also the making of faces can be employed in unilateral malingering, as well as in bilateral, by first placing a bandage over the sound eye, or directing the claimant to hold

a hand across it. One of the best of the threatening motions consists in making as if to poke a finger into the eye.

The false attribution of ocular injuries or diseases.

The false attribution of ocular injuries or diseases (by which we mean, as before stated, the assignment of an untrue cause to a real injury or disease) is, like simulation, very common. On the other hand, unlike simulation, it is often accompanied by exaggeration. (Exaggeration can also exist without false attribution.) In fact, false attribution is much more common than simulation, for the reason that this particular form of falsification can be applied to a vastly wider range of injuries than can the latter description of malingering. Simple simulation, indeed, is, as a rule, from its very nature restricted to kopiopia, to concentric contraction of the visual fields and scotomata, and to amblyopia and amaurosis, while fraudulent attribution can find full play and opportunity in well-nigh every conceivable form of ocular incapacity, and, moreover, almost always has objective symptoms to give it plausibility.

To take a few examples. A man is afflicted from childhood with strabismus. After a railway wreck, he alleges that certain injuries received by him at the time of the accident are responsible for the crossing of the eyes. A woman has congenital colobomata of the irides. After falling through a defective sidewalk she declares that since the injury, she has had no sight whatever, and she offers the colobomata as objective evidence that her eyes were actually injured on the occasion of the fall. A man afflicted with detachment of the retina due to extreme myopia, seeks, some day, to ascribe his diseased condition to the undue force with which he was ejected from a room in which, against the protests of the proper occupants, he was endeavoring to sell goods. A man on whom a charlatan was "operating" for the removal of a "cancer" from the eyelid, received upon the pupillary area of the cornea a drop of some sort of acid. A dense leucoma formed, with the total abolition of qualitative sight, and, some six years later, the victim sought to prove that the corneal opacity had been developed in consequence of an injury received in a mine. Such are a few of the almost infinite forms and varieties which fraudulent attribution assumes in connection with injuries to, or diseases of, the eye.

In discussing these various forms and varieties we divide our subject into:

1. Injuries affecting the eyelids and eyebrows. 2. Injuries affecting the conjunctiva and cornea. 3. Injuries affecting the iris. 4. Injuries affecting the lens. 5. Injuries affecting still deeper portions of the eye.

1. *Injuries affecting the lids and eyebrows.*—With respect to the false assignment of causes in the case of injuries to these parts, it is always necessary, of course, to consider the nature of the wound or wounds in relation to the cause assigned. It will often occur that the cause assigned could not possibly account for the appearances produced. On the other hand, the examiner must be cautious not to declare as impossible a cause which, after all, is really the true one. Thus, as stated already, under the heading of "The commonest injuries with which the ophthalmo-surgical expert has to deal," I mentioned the very deceptive appearance which is often produced by contused wounds of the eyebrow, these wounds not very infrequently seeming to have been produced by a knife, axe, or other cutting instrument, though produced in fact by the fist. I also indicated the great importance attaching to a correct distinction between contused wounds and incised wounds in this portion of the body, persons often being accused of assault with a deadly weapon, or intent to kill, when, as a matter of fact, they are wholly innocent of such a high-grade crime.[1] The distinction is easily made, as may be recalled, by means of the following signs: 1.—A contused wound is the far more likely to present an areola of ecchymosis. 2.—Under a lens, the walls of a contused wound are seen to be not actually smooth, but more or less ragged. 3.—While an incised wound shows all the tissues divided just as deeply down as the wound reaches, a contused wound mimicking an incised wound, shows some of the fibers of the more resisting tissues undivided, while others, deeper down in the wound, are severed. 4.—The really contused, though apparently incised, wound is generally more extensive (longer) at the bottom than at the surface, while the really incised wound is apt to possess a so-called "tail" both at the beginning and at the end—in other words to be of greater extent in the skin than in the deeper tissues. This distinction is due to the fact that, in the really incised wound, the inflicting instrument cuts from without inward, whereas, in the case of a wound of the contused variety, the incising instrument—the bone—cuts from within outward.

It is always worth remembering that not infrequently a claimant is honestly mistaken as to the nature of the weapon with which his wound was produced. Thus, he may, reasonably enough, have seen a flash from a ring or a cuff-button, worn by the assaulter, and, later, observing the apparently incised nature of the wound, have come to

[1] It is owing to the great importance of this distinction that the matter is given some treatment under the present head as well as under that of "The commonest injuries with which the ophthalmo-surgical expert has to deal."

the conclusion (more or less unconsciously perhaps) that what he has seen was the flash of a knife. He will then, almost to a certainty, declare (and of course with the utmost honesty) that he saw a knife in the hand of his assailant, or even, in case he happened to be possessed of a rather active imagination, that he saw the assaulter "draw" a knife.

As an instance of the opposite state of affairs, i. e., when it appears from the look of the wound that a knife could hardly have been employed, although, as a matter of fact, a knife was the actually inflicting instrument, I refer to the rather rare instances where a single sweep of a knife across the eyelid has occasioned a zigzag wound, presenting a torn—the so-called "lacerated"—appearance. This phenomenon is due to the fact that the knife, before it cuts, stretches out the very extensible skin before it and then parts the tissues. When the skin goes back into place, the appearance is that of a V or a Z, as if a hook or some such object had engaged in the skin of the lid and then torn it in two or more directions, or perhaps had engaged more than once in the skin. In the case of wounds like these, the question sometimes takes the form, not as to whether a knife was the actually inflicting instrument, but as to whether a knife which is admitted to have been employed for one single stroke, was not really used again and again, the answer to this question having an important bearing on the legal inquiry as to whether (in case the user of the knife was acting in self-defense) the self-defender did not, by the employment of "excessive force," become in his turn (from the legal viewpoint) the aggressor.

Wounds of the eyelid are sometimes produced voluntarily, with the intent to ascribe the injury to an accident or an assault ("putative," or "self-inflicted," wounds) and then are almost always superficial in character, the lips of the wound, however, being kept apart sometimes, during the process of healing, in order that a large and showy cicatrix may result. Almost invariably, in such instances, the factitious wound has been resorted to in order to give objective evidence to a claim of traumatic amblyopia or amaurosis. The superficial character of the scar, together with the various tests for simulated amblyopia and amaurosis, as above set down, will almost invariably reveal the fraudulent character of the claim.

Ecchymosis, being a very common accompaniment of contused wounds of the eye, affords at times important evidence in connection with fraudulent claims. One should ever bear in mind that an ecchymosis of these parts is at first violet, blue-black, or livid red in color: in a day or two, green, then yellow, then lemon-yellow, finally whitish-yellow and normal. One should also remember that, in ecchymosis of

the upper lid, the darkest portion of the discoloration is always, after the lapse of a few hours, at the lower lid-margin,[1] the changes in color above noted showing earliest at the upper boundary of the discolored area. It is, of course, impossible to determine the precise age of an ecchymosis from its color; yet, in many instances, the hue of the part affords irrefragable evidence of a fraudulent claim. Thus, for example, if a claimant with an ecchymosis in the livid, or blue-black, stage, especially if the darkest part (in the upper lid) had not yet settled down to the lower lid margin, should allege that this discoloration had been produced a week or thereabouts before, we should know to a certainty that he was "mistaken."

Emphysema, with crepitation, of the lids and orbit can be produced by injecting air into the loose areolar tissue of these parts, and a simple tumefaction without crepitation, lasting for several days, can be produced (as every ophthalmo-surgical expert knows) by the hypodermic injection of solutions of cocain and other substances—and, in some instances, even of plain water.

Ulcers in the skin of the eyelids can easily be manufactured by means of the various irritants, corrosives, and vesicants. The most commonly employed are: chewed tobacco, bruised garlic, nitric acid, corrosive sublimate, and quicklime. I have even been informed that a miner who was lightly burned in a mine explosion actually burned the lids of both eyes, as well as other portions of his face, by means of a candle flame, applied by his own hand, in order to increase the extent and severity of the ulcers that followed, and thus the amount of probable compensation to be received by him.[2]

The injuries and discolorations produced by the different sorts of acids and alkalies are worth recalling in connection with the fraudulent or mistaken attribution of injuries. Thus, sulphuric acid turns the skin brown; nitric acid, yellow; while hydrochloric acid either does

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[1] A phenomenon due to the fact that the extravasated blood "settles" down through the loose interspaces of the palpebral areolar tissue till it reaches the lower lid margin. About the body generally, the darkest portion of an ecchymosis corresponds pretty closely to "the point of greatest violence"—*i. e.*, of greatest crushing, or contusing, force—a state of affairs which continues as long as the ecchymosis remains visible.

The extravasated blood not infrequently seeps beneath the skin covering the dorsum of the nose, and so on into the loose areolar interspaces of the lids of the opposite eye (the falsely denominated "sympathetic" ecchymosis). The skin of the nose being very thick and opaque, the ecchymosis is, in that part, invisible, and hence it appears that an independent ecchymosis of the opposite eye has taken place, perhaps as the result of a fracture. This phenomenon of an apparently independent ecchymosis in the opposite eye, is so common, after an enucleation of the eyeball, as to be familiar to all ophthalmic surgeons.

[2] It may not be uninteresting to note that the artificial production of ulcers is probably "the earliest, as it has been the most extensively excited disease." Gavin, *Feigned Diseases,* London, 1843, p. 332.

not stain it at all or turns it very faintly yellowish or yellowish-brownish. Acids (especially "vitriol," or sulphuric acid) were in former days frequently (they are even yet occasionally) "thrown" by women into the faces of their rivals, with the almost invariable results that the skin of the eyelids and eyebrows was cauterized, and a suit for damages or criminal prosecution (not infrequently both) was now and then the result. Acids, too, as already stated, are used for the artificial production of ulcers and cicatrices, on which conditions a claim for damages can be based. Alkalies discolor the skin at first white; later, red or dark-brown.

To distinguish the so-called "burns" produced by such escharotics from burns produced by heated substances—a distinction sometimes necessary—the following points are useful:

(a) If the injury be recent, a chemical test can be made, and the presence of sulphuric, hydrochloric, or nitric acid, or other escharotic liquid on the skin can easily be determined. If any of the escharotic has been spilled upon the clothing, or other surrounding objects, the chemical test is still more applicable.

(b) Scorching of hairs in the neighborhood of the injury, points to a heated substance of some sort as the almost certain origin thereof, for escharotics do not affect the hairs of the nearby parts.

(c) Blisters, which are almost always present after injuries produced by heated bodies, are never produced by the action of escharotics.

(d) After the action of an escharotic there is never capillary congestion (erythema) of the skin surrounding the injured area. This phenomenon occurs invariably after burns by heated substances, if of more than the first or second degree, unless the injuries are followed so promptly by the death of the injured person that this symptom of reaction does not have time to appear.

(e) Burns by heated solids can generally be distinguished from burns by heated liquids, as well as from the results of escharotics, whether liquid or solid, by the fact that the eschar which is produced by an escharotic, or by a heated liquid, is soft and moist and yellowish, instead of hard and dry and dark, as after an injury produced by a heated solid.

A very important subject in connection with the fraudulent attribution of injuries, is that of scars in the skin of the lids, especially with relation to their age, for, sometimes, the false attributor alleges of an ancient cicatrix that it is recent, or, on the other hand, of a recent cicatrix, that it is old. Such people also not infrequently cause cicatrices to be artificially removed (so far at least as this is possible)

and, on the other hand, declare that scars which formerly existed have spontaneously disappeared.

At the very beginning it should be thoroughly understood that, in the skin of the eyelids as in other portions of the body, very superficial burns or wounds, involving only the epidermis or the superficial part of the derma, produce no scar at all or else a scar that promptly disappears completely. We may also say—for the sake of completeness, since the matter is otherwise unimportant—that a punctured wound produced by an instrument of the nature of an extremely fine needle and consisting merely in the separation of the anatomical elements of the skin and underlying tissues without the production of a bloody tract, produces absolutely no cicatrix whatever of any sort or kind. In the case of a punctured wound accompanied by the production of a bloody tract (however slight the hemorrhage may be) there results invariably a scar. This scar, at first, is merely a reddish point. Later, it becomes of a dark brownish color, and increases a trifle in area (as any one has seen in the case of the punctate scars produced by sutures in the skin of the lid). Still later, the scar begins to bleach, and, at the same time, to contract, till, finally, the color is a pearly-white and the area very small indeed. May such a scar disappear entirely? In my opinion it may, practically at least, whatever it may do theoretically. Linear wounds and wounds of square extent, result in cicatrices, invariably. Generally speaking, too, such scars are indelible unless tampered with. However, scars in the skin of the eyelids disappear oftener and more completely than in almost any other portion of the body. Operations, furthermore, may be resorted to which change the appearance of all such scars, or even (when the cicatrices are not too extensive or too deep) remove them to such a degree that, at least for all practical purposes, the condition of the skin is exactly the same as though the scar had never come into existence. If the scar is too deep, the skin can never be restored quite to its former condition of free extensibility (permitting, in fact, of far withdrawal from the underlying parts) and, if too extensive, the skin will, after the operation, be shortened and tight-looking, devoid, in fact, of the folds and wrinkles displayed by the skin of the corresponding lid of the other eye. Sometimes, however, by an operation on this other eye, a symmetrical and therefore very deceptive condition indeed can be produced. Extremely accurate examination is necessary in all such cases, and a magnifying glass is often helpful.

Just at what age of the wound the different color-changes occur in a scar cannot be determined precisely (however devoutly such a consummation might be wished) even for a particular case. In general,

however, cicatrization is complete (i. e., the scar has completely *formed*) in about four days after a simple, linear, and non-infected incised wound, whose lips have been appropriately approximated. Wounds of superficial area heal more slowly than incised wounds and wounds in aged persons or diseased subjects much more leisurely than in young and healthy. The pink, or reddish, *young* cicatrix turns to the older brownish variety in about eight weeks, or perhaps a little more. In from two to three months additional, the cicatrix has bleached and taken on the well-known appearance of an ancient cicatrix—an appearance which, under normal circumstances, is just about permanent.

All cicatrices, however, whatever their original shape, in the eyelids as elsewhere about the body, tend to become more and more linear in form. Then, too, ancient cicatrices, in the skin of the eyelids as in the body generally, get a trifle smaller in area and a little thicker, as they increase in age, excepting in children only, in whom they actually enlarge in area as well as in thickness. When, however, children reach adult life, their ancient cicatrices begin to contract.

Scars are much more apparent in brunettes than in blonds, and they are also said to stand out much more plainly in negroes than in Caucasians, by reason of the fact (as alleged) that a cicatrix never acquires a *rete mucosum* even in the negro and hence is forever devoid of coloring matter even in the African race. In my personal experience, however, the statement has not held good. I have seen in negroes numerous scars that were very deeply pigmented, and, in the eyelids, many that required the most careful observation for their detection.

Scars otherwise imperceptible may often be brought out plainly (in the white race) by smart friction of the lids, a procedure which reddens the skin and makes the white scar plainer by the contrast. A lens is always useful.

Burns produced by explosions of gun-powder sometimes have to be distinguished from those produced by fire-damp explosions, which occur so frequently in mines. The necessity is all the greater from the fact that, in each of these kinds of burns, the hairs of nearby (possibly also distant) parts are invariably scorched: hence no means of distinction is afforded by the presence or absence of scorched hairs. However, the distinction is very easily made by the difference in the tattoo marks in the skin which each of these forms of explosion produces. The distinction is made in three ways: 1.—The coal tattoo is blacker, and less violet, in color, than the dotting made by gun-powder. 2.—The coal-dust spots vary greatly in size, while the dots from gun-powder are almost absolutely uniform. 3.—Particles of gun-powder,

or of coal, can be picked out of the skin, and their nature determined chemically.

2.—*Injuries of the conjunctiva and cornea.*—In *traumatic conjunctivitis* the question is nearly always as to whether or not the inflammation of the conjunctiva is traumatic or non-traumatic in origin. How, then, can a distinction be established between a traumatic conjunctivitis and one not traumatic? If the conjunctival inflammation be alleged to have been produced by a powder or a fire-damp explosion, there will nearly always exist in the conjunctiva (also, perhaps, in the skin of the lids) the same, or a very similar, bluish or blackish tattoo which is produced in the skin by such explosions. There will also exist the indications of a burn, namely, shortening, thickening, wrinkling or puckering, and opacification of the conjunctiva, as well as adhesions (symblepharon) between the eyeball and the lids. Burns by acids and alkalies leave also conjunctival cicatrices, together with, almost invariably, the characteristic stains upon the skin. Any considerable quantity of nitric or sulphuric acid in the eye causes deep sloughing, which means, of course, perforation of the eyeball.

Conjunctivitis, alleged to be due to trauma, is occasionally manufactured by the intentional introduction into the conjunctival *cul de sac,* of tobacco juice, particles of sand, bits of lime, drops of lemon juice, and solutions of bluestone or corrosive sublimate. Foreign bodies of considerable size and irritating properties have been discovered, neatly bestowed within the folds of the upper conjunctival commissure, to the presence of which was due a spurious conjunctivitis; it is therefore desirable, in all suspicious cases of traumatic conjunctivitis, to examine carefully the recesses of these folds.

Traumatic pterygium occasionally occurs as a result of injury to the conjunctiva and cornea, and, now and then, a claimant for damages alleges that a pterygium of the ordinary spontaneous[1] variety was produced by an accident for which he seeks to hold some company or individual responsible. The distinguishing points, however, between these two varieties of pterygia render impossible the acquiescence by any honest expert in such a mistaken, or fraudulent, explanation of the origin of the growth. The central point of distinction lies in the fact that a pterygium of traumatic origin (customarily so designated) does not possess a pterygial canal, or epithelium-lined passage which lies between the growth and the eye at the sclero-corneal junction.

[1] All the so-called non-traumatic, or spontaneous, pterygia, however, probably originate in slight, repeated traumata. See on this head an article by the present writer, entitled "Pterygium," in the *Ophthalmic Record,* Vol. 14, No. 10, Oct., 1905, p. 465.

Further, a pterygium of traumatic origin is often adherent more or less extensively to the eyelid, thus giving very plain evidence as to the nature of the origin of the growth. Still further, a traumatic pterygium is less transparent, thicker, and also less freely movable on the sclera. Then again, a false or traumatic pterygium is seldom situated (as is that of the ordinary variety) symmetrically astride the horizontal meridian of the eyeball—in fact not only is it often more above or more below this line, but it is not infrequently situated wholly above or wholly below the cornea. Finally, a traumatic pterygium is never progressive, while the ordinary, or true, pterygium may or may not be so.

3. *Injuries of the iris.*—The salient points to be remembered in connection with the fraudulent or mistaken attribution of injuries to the iris relate to the fact that many anomalies of the iris, which seem to the inexperienced observer to be traumatic, are really congenital. These matters were considered somewhat fully in a former division of this article, but here it may be well to remind ourselves of the following extremely important characteristics of certain congenital anomalies.

a. The threads of a persistent pupillary membrane (often mistaken for posterior synechiæ) do not arise (as do the synechiæ) from the margin of the iris or its posterior surface, but from a point on the anterior surface of the iris, a trifle removed from the pupillary margin. Also, under atropin, these threads prove very elastic.

b. Congenital coloboma of the iris can be distinguished from traumatic coloboma and from retroversion and retroflexion by the fact that, in a congenital coloboma, the sphincter iridis continues into and around the gap unbrokenly. Further, it is almost (though not quite) always situated below, and is frequently associated with coloboma of the choroid, corpus ciliare, and lens.

c. Heterophthalmos, corectopia, and polycoria, are liable to be mistaken by the ignorant for the results of traumatism, but a person accustomed to examining injured eyes could hardly be imposed upon to that extent by such plainly congenital anomalies.

4. *Injuries of the lens.*—A claimant now and then attributes to an accident or an assault a condition of the crystalline lens which is really congenital or the result of some spontaneous disease.[1] Thus, a congenital, or a senile, or a diabetic cataract may falsely be attributed to

[1] It would seem, according to Woodward, that traumatic cataracts had been known to be "self-inflicted," or "putative." Thus that writer in Witthaus and Becker's *Medical Jurisprudence, Forensic Medicine, and Toxicology*, 1896, Vol. III, p. 28: "Cataract has been intentionally produced by thrusting a needle or a knife-blade through the cornea into the crystalline lens."

a cause for which some corporation or individual could be held responsible in damages. A traumatic cataract, however, is generally produced by the action of a penetrating instrument (this, sometimes, is a foreign body which remains) and, in such a case, the tract whereby the inflicting instrument made its way through the ocular tissues to its point of contact with the lens, is easily enough determined. In such a case there can be no doubt as to the origin of the cataract. Even if the instrument were very small, for instance a delicate needle, no doubt could exist if lenticular matters were being extruded into the aqueous through a rent in the capsule. Sometimes, however, a mere contusion, or concussion, of the eye suffices to originate a cataract, and then the distinction between such a lenticular turbidity and a congenital or senile cataract may become a harder matter. Even in such a case, however, the distinction is generally sufficiently obvious on account of the extremely regular and symmetrical appearance of congenital and senile opacities, while the lens turbidity produced by traumatism of any sort is nearly always irregular. Then, in addition, in congenital cataract, the eye as a whole is apt to be very badly developed. The claimant's history will almost always, unless he be an infant, conclusively settle the matter.

Luxation and subluxation of the lens may be congenital or the result of disease, as well as produced by trauma. When occurring as the result of disease, the pathological condition consists of softening and wasting away of the zonula, which, in its turn, is occasioned by high-grade myopia and choroiditis. Then, too, a spontaneous variety of dislocation occurs in hypermature cataracts as a result of overstretching of the zonula. The various concomitant conditions, of course, point out the nature of these spontaneous dislocations, while, where the lens is congenitally out of place, the dislocation is almost always upward, the lens is small in size, the eyeball as a whole is apt to be poorly developed, and, finally, there exists a life-long history of inferior vision.

5. *Injuries affecting still deeper portions of the eye.*—Injuries of the vitreous, the sclera, the choroid, the retina and the optic nerve, are also now and then attributed to supposititious causes, but, in these cases, the ophthalmic expert has little that is special to guide him; he can merely employ his knowledge of ocular pathology in general.

Exaggeration of ocular injuries and diseases. Tests for exaggeration.—Exaggeration of the effects upon the sight of various actually existing injuries and diseases (whether or not such injuries and diseases are attributed to untrue causes) can generally be detected by noting the nature and situation of the various pathological lesions,

and also by means of the tests for simulation (laid down some distance *supra*) since the tests for simulation are useful in exaggeration. Of especial importance among these tests is that of Alfred Graefe, because thereby the examiner may, unknown to the subject of the test, determine accurately the visual acuity of each eye. It should be remembered that an actually existing amblyopia may be so exaggerated as to seem an amaurosis, and also that even an actual amaurosis may be exaggerated by the contention that it has been in existence for a longer time than is really the case. In the latter state of affairs, if the amaurosis be alleged to be of very long standing, the examiner will, of course, be careful to note whether, as yet, the eyes have taken on the "staring, fixed, unmeaning" look of eyes that are truly blind, as well as whether the applicant himself has acquired the short steps, the upturned countenance, and the generally "listening" expression.

Dissimulation of ocular defects and diseases. This form of falsification is not very common in America. In Europe, however, especially since the passage of the various "Workmen's Compensation Laws" (which render employers liable for injuries to their workmen, irrespective of all such technical matters as assumption of risk, contributory negligence, etc., etc.) the number of dissimulators has increased enormously. This consequence arises from the fact that, when an employer is obliged, in effect, to insure his workmen, he desires to know to a certainty before he grants employment to any given man, that the applicant is possessed of sufficient visual power to keep from being hurt. He stands, in a word, where subject to such laws, in much the same position as an accident insurance company or a life insurance company. For this reason, it is said, the Workmen's Compensation Laws, beneficent as they are in many respects, have entailed much hardship on workmen already defective. Defective workmen, in fact, find great difficulty in securing employment where such laws as those in question exist. And even in America, dissimulation is practised now and then, not only by those attempting improperly to effect accident or life insurance, but also by persons endeavoring to secure employment with railway or steamship lines, to be admitted to the army or the navy, and even to contract advantageous marriages.

Our chief solicitude should be, when testing the eyes of those who may be dissimulators, not to rest content with a mere determination of the central visual acuity. Thus, a person's central vision may very well be in each eye 20/15, or above normal, and yet his peripheral vision be very poor indeed. Again, with excellent central sight, he might be harboring a foreign body in the vitreous, or be suffering from chorio-retinitis, peripheral lenticular opacity, or eccentric ulcer of the cornea. Further, he might be afflicted with mydriasis, with or

without paralysis of the accommodation, or, if tabetic, with Argyll Robertson pupils.[1]

Visual economics.[2] An expert witness is often required to furnish the jury certain facts and principles in accordance with which that body may be able to determine the amount of damages which ought to be awarded, or, as the law expresses the matter, "to assess the damages." We have already seen that, in assessing damages in a personal injury case, a jury may allow for matters such as: (1) necessary and reasonable expenses—hospital fees, for example, and nurses' and doctors' bills; (2) loss of time; (3) pain and suffering; (4) disfigurement; (5) reduction of the earning capacity. This latter is often, perhaps generally, the most important item in the list. Now it so happens that, with respect to injuries of the body generally, either the actual reduction in the earning capacity must merely be guessed at in the most haphazard fashion, or, really, cannot be estimated at all. In the case of the eye, however, the matter is different. When an eye is injured, an experienced oculist can (as a rule to which there are scarcely any exceptions) determine the quantum of injury (i. e., the reduction of earning capacity) with well-nigh mathematical accuracy. Nevertheless, owing to the fact that a proper formula had not yet been worked out, the accurate estimation of the loss of earning power was, even in a case of ocular injury, by no means possible until very recent years. Now, however, thanks to the labors of Zehender,[3] Groenouw,[3] Heddæus,[3] Jatzow, Josten, Hansel, and, most of all, to Magnus,[3] of Breslau, and Würdemann,[3] of Seattle, the subject of "Visual economics" has been developed into a useful and, everything considered, extremely accurate science.[4]

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[1] Finally, he might be afflicted with an excellent memory, in support of which paradox I cite the case of a gentleman who, a number of years ago, desired that I permit him to copy the four smallest lines, together with the largest, of each of my Snellen cards. He intended, he said, "to take an examination for a railroad," and, being "short" four lines, or thereabouts, to commit the top line and the bottom four to memory. Thus fortified, he could read the bottom four lines of any card, out of his memory, whenever he saw the top one. The company-doctor and I, he said, had just the same identical cards.

[2] For an entirely different view of this subject, see, in this *Encyclopedia,* "**Visual economics,**" a very thorough article by Dr. E. E. Holt.

[3] These men have proposed formulas; the others mentioned have proposed no formulas, but have rendered yeoman service in connection with "Visual economics" nevertheless.

[4] The classical work on the subject is "*Visual Economics,*" by Magnus and Würdemann, Seattle, Wash., 1902. So exhaustive and so accurate, in fact, is this little book of 115 pages, that but little apparently remained for subsequent writers on the topic of "Visual Economics" to do, but to amplify or to abridge that epoch-making book. Dr. E. E. Holt, however, has added to the subject much that is novel and interesting. The reader who desires to study the subject thoroughly, is, therefore, referred to the book in question as well as to the major article of Dr. Holt: all that is here attempted is an abstract of the Magnus-Würdemann volume. Moreover, whenever possible within the limits of this article, I permit the authors of that treatise to speak in their own words.

Passing by the formulas of Zehender, Groenouw, and Heddæus, which have been supplanted entirely by that of Magnus and Würdemann, I will state the latter formula at once, and then proceed to an explanation of the means whereby that formula is ophthalmologically and mathematically deduced.

The formula itself.—The complete formula, then, for the ocular earning ability, is as follows:

$$E = C\ (\text{max.})\ \sqrt{P}\ \sqrt[4]{M}\sqrt{\frac{C_1 + C_2}{2}}\ \sqrt{P}\ \sqrt[4]{M}.$$

Now, while this formula, at first sight, appears a little complicated, it is really rather simple, as will readily appear from the forthcoming explication. Moreover, as Magnus and Würdemann state,[1] "If we try to simplify the complicated relations they could only be forced, and an arbitrary speculation substituted for its [the formula's] own composite character." Then, too, this formula is not by any means supposed to be presentable to a jury, but only its results; as, for instance, that the earning power of the plaintiff in the particular case at bar has been reduced, in consequence of the injury of which he complains, by 42 per cent. Exactly what amount this percentage of reduction would be equivalent to, expressed in dollars and cents, would be for the jury to compute, and, indeed, they ought to be equal to so very simple an arithmetical task.

The method whereby the formula is obtained.—The formula in question is based upon the supposition (which surely is not refutable) that "injuries affecting the vision have a direct detrimental effect upon the earning capacity." From this very simple proposition there follows another, which is almost equally self-evident, namely, that "the earning ability . . . is practically synonymous with the visual earning ability." True it is that, in certain occupations, "such as banking" and "some mercantile pursuits and professions where knowledge may be assimilated through the eyes of others . . . some specially well placed and talented individuals may continue to be economic factors;" but these are great exceptions, and, in the vast majority of cases, the blind are "incapable of earning anything" and are "a charge upon their families and upon the community."

Now, it would seem, at first, to follow, from the second of these propositions, that the "visual earning ability" was exactly synonymous with "the visual working ability," i. e., that any reduction in the visual acuity, or other functional ability of the eyes, would necessarily result

[1] Magnus and Würdemann, *Visual Economics*, p. 53.

in a loss of the ability to follow a gainful occupation. This, however, is not at all the case, as will appear hereafter. Various ocular incapacities can, in fact, exist, without the slightest loss of earning power being occasioned thereby. However, more of this hereafter.

The factors which constitute the earning ability.—In a normal person the complete earning ability "is a composite quantity resulting from three factors:

"(1) The unimpaired functional power of the bodily organs.

"(2) The technical knowledge which is necessary for the carrying on of the vocation.

"(3) The ability of the individual to compete in the labor market."

The most important of these three factors is the normal functioning power (devoid of sight, a person is, as a rule, altogether dependent upon the bounty of others); a very close second in the matter of importance, at least in very many occupations, is the preparatory education, or technical knowledge; while, far in the rear, we find the ability to compete.

In making out the formula which is to express the equivalents and make up of the normal earning power, we designate that power itself by E. Then we express the three elements of which that composite quantity is made up, as follows: the functional ability, by F; the technical knowledge, by V; and the ability to compete, by K. The formula for the full normal earning ability is, then, this:

$$E = F\ V\sqrt[x]{K}$$

K, it is of course necessary to notice, is taken as a root, not as a full, value. The reason for this is stated by Magnus and Würdemann thus: "In this formula we put the two quantities, F and V, in their full value and accept K as a root value. There would be nothing changed in the total value of the formula itself because as the root of 1 is always 1, and we regard F, V, and K as 1, it is immaterial for the formula itself if we take one of the three quantities as a root or not, but this proposition immediately changes when the part introduced as a root grows smaller than 1, as happens in each ocular injury, because the root of each genuine fraction is always greater than the fraction itself. Thus the influence of K, after being introduced as a root value, if it has fallen off by an injury to $\frac{K}{Z}$ cannot be any more $\frac{K}{Z}$ — but must be greater, for instance, $\frac{2K}{Z}$ Therefore, the damage to the total value of the formula will be smaller if we take K

as a root value. By the total elimination of K the earning ability will not be diminished, but it will be by a smaller damage, according to the influence the damage of K shall exercise upon the value of the total formula. We will have to choose the exponent of the root as smaller or greater, according to its rating. The value of a root of a genuine fraction is much greater if its exponent is small. Therefore, if we wish to lower it considerably, we take a small, if we wish to affect it less, a greater exponent for K. While the ability to compete, K, is comparatively very little impaired through minor ocular injuries, it is very much so through the loss of one eye; we suit these conditions by choosing a greater exponent of the root in slight injuries, but a smaller exponent for serious ones. We will adopt for the slight injuries K as the 10th root and for serious ones according to the demands of the profession, the 7th root or the 5th root. . . . An exact calculation of such a changeable quantity so dependent upon the individual cannot be made. The calculation of the competing ability cannot be waived entirely, . . . but should include all factors that are relative; as we will show further on, the peculiarities of the individual case may always be considered.

"When we express the earning ability through the three factors, F, V and K, we present E, not as a sum, but as the product of these quantities, as multiplied thusly: $E = F\ V\ \sqrt[x]{K}$, in which the exponent x changes with the degree of the functional damage. E must always be regarded as a product and not as a sum, to meet all possibilities occurring in practice. If we add F, V and K, the formula would give wrong practical results, as we see in the following example: Supposing both eyes were lost in an accident, the quantity F of our formula would be o. If we had connected F, V and K with the +, and added, even if K would have become o, $V + \sqrt{K}$, which is the remainder of the earning ability, would have been left. This would be entirely wrong, because a laborer who has lost his functional ability, especially the sense of sight, should be regarded in an optical way as entirely unable to earn. Taking the same example and using our formula with F=o, E immediately becomes o, because each product is always o if one of the factors is o. If we would leave V out of our formula, E of course =o, and actual practice confirms this, because even the most simple hand work requires a certain amount of preparatory education. Finally, if we drop the third factor, the 10th root of K, the normal earning ability according to our formula becomes o, which is likewise shown by practical experience, because, even though an individual is in good health and by reason of preparatory education has the skill to work, if his work is not needed,

his economic value is *nil*. He may possess the power of working, as the factors F and V are present, but he only has earning ability when he can dispose of the work in the economic market. Therefore, if from our formula ($E = F\ V\ \sqrt[x]{K}$) we take away the factor $\sqrt[x]{K}$ (the ability of the individual to dispose of his work), the remainder, which is the formula for the working ability (A), would be $A = F\ V$.

"The 'working ability' is not synonymous with 'earning ability,' although some authors would have it so, for instance, Becker (5, p. 9): The words 'working ability' and 'earning ability may be regarded identical in meaning, because in each worker the latter depends upon the former.' Even if this be so, the two conceptions are not the same, and such a rendition obscures the conception of the earning ability, our definition of which should be clearly understood.

"The calculation of injury to the earning ability proposed by us starts from the formula for the *full earning ability:* $E = F\ V\ \sqrt{K}$."

The formula may be simplified by the absolute omission of the factor V. Important as is this factor (the preparatory or technical education) it will never itself be damaged directly by any ocular injury. "Certainly the visual function may be diminished to such an extent that the realization of the technical knowledge becomes limited, but this injury to the earning ability in such a case does not rest upon a diminution of the knowledge and the capacity, but limitation of their use. We calculate the extent of such limitation, according to our method, directly by the factor F, i. e., from the performance of the visual act, which is the essential factor in the full earning ability, damage to which is synonymous with damage to the total. Calculating F we have already used V. For simplicity's sake it would be better to omit V entirely. The *working formula* for the earning ability then would be: $E = F\ \sqrt[x]{K}$."

As, however, we look at this simplified equation, the thought is borne upon us that, before we can apply this formula for the estimation of visual economic damage, we shall have to consider the various elements of which F (the functionating ability of the eye) is composed—for F is, undoubtedly, a composite, and not a simple, quantity. F, in fact, is composed of:

1. The central acuity.
2. The visual field.
3. Light and color senses.
4. The adaptive faculty.
5. Muscular movements.
6. The cerebral processes.

Again, however, we may simplify: undoubtedly not all of these factors are necessary to be considered. The cerebral processes, for example, may be left out, because in cases of injury to the brain sufficiently severe to affect the cerebral ocular centers, the damage is by no means limited to these centers and the neurologist, instead of the oculist, is called in. The sense for light and color, furthermore, and that of adaption, are not to be considered separately, because an injury limited to these functions is unknown. Such an injury is always an implication in, or complication of, an injury to the visual acuity or else to the visual field. When, therefore, we allow for damage to the visual acuity or the visual field, we include the implicated injuries to the light and color sense and to the power of adaption. Thus the six constituents of F reduce themselves, in practice, to only three. These three constituents stand to one another in the relation of factors of a product; for, in the following of an occupation, not a single one of these factors could be left out. Devoid of any single one of them, the possessor of the damaged eyes would have an earning power of practically nothing whatever. The elements, therefore, should be regarded as factors; not as the elements of a sum; in other words, as $o \times 1 \times 1$, and not as $o + 1 + 1$.

Perhaps the assertion that the leaving out, or rather the destruction of any of the three important elements of F, would result in what is practically complete annihilation of the earning power, should receive a modicum of consideration. Let us first regard the element of central acuity, which, for brevity, we may represent by the letter C. Now, a person who has, in both eyes, lost C—i. e., is suffering from a large central scotoma—sees absolutely nothing whatever at which he directly looks. He can only see a given object by looking somewhat away from it, and, under such circumstances, an artisan is totally unable to work. Perhaps a person afflicted with a large central scotoma might be able to earn a trifle as a messenger. Practically, however, he is totally blind. If, again, a person, though retaining C, has yet been deprived of all peripheric vision—which we shall represent by P—he also could not work at any trade, "as is readily seen in cases of double-sided hemianopsia." Still further, if a working man were to suffer complete paralysis of all the extrinsic muscles of both of his eyes—in other words should lose what we shall represent by M—he, also, would be totally disabled. The only visual act which he could execute would be to "stare into vacancy," and see double. He would also have no power to estimate distances or the size of objects. Even though he should close or cover one eye, and thus pre-

vent the disconcerting diplopia, the other eye would be immovable and therefore useless in an economic sense.

Returning to our formula, before we substitute for F its factors, C and P and M, we must consider certain very significant matters which are connected with these factors. In the first place, as to the relative importance of these factors, C (the central visual acuity) is the most important of all. Whatever reduces C below the lowest limits demanded by the kind of trade, or calling, in question, of course produces for that work a total disability. P (peripheric vision) clearly comes next to C in importance, while, finally, there comes M. With regard to this factor M, furthermore, we have to consider the very important fact that the effect of a paresis or paralysis of a single, or of several, ocular muscles, is very different indeed, according as we have to do with monocular or with binocular vision. Monocular vision is, in fact, but little affected even by the complete paralysis of a single extrinsic muscle. Such an affection merely diminishes the motility of the eyeball. In binocular vision, however, the element of diplopia enters in—a fact "of the greatest importance, as it excludes, temporarily, at least, retention of working binocular vision." In the construction of a formula, therefore, we treat the factor M in a different manner, according as we have in view binocular, or monocular, vision. "In the formula for binocular vision we take the muscular movements of each eye as the product of different factors, each of which corresponds to the activity of a particular muscle. Now, if we mark the muscles of one eye with ($m^1m^2m^3m^4m^5m^6$) and those of the other ($m'^1m'^2m'^3m'^4m'^5m'^6$) etc., we would represent the whole muscular activity as ($m_1m_2m_3m_4m_5m_6$) ($m'_1m'_2m'_3m'_4m'_5m'_6$). In this conception the whole product would be o, by losing one single muscular motion, and therefore the binocular act would be negative. In monocular vision the muscular activity should be conceived as the sum of the single performances, because, by losing one of them only, an ocular detriment has been created and not total earning disability, thus $m_1+m_2+m_3+m_4+m_5+m_6$."

Still further, M and P should both be added to the formula as root, not full, values, precisely as was done in the case of K (afterwards omitted) and for exactly the same reason—i. e., the damage to the total value of the formula will be smaller (which accords with the less importance of M and P as compared with C).

In the words of Magnus and Würdemann again: ". . . the value of the root of a proper fraction increases with the amount of its exponent, thus, if we introduce M with a greater exponent of the root than P, in the case of damage to M, it will exercise less influence

upon the total value of the formula. We believe that we may place the relative value of the visual field and the muscular movements by choosing as exponent of the root in the former 2, and in the latter 4. Of course, these are arbitrarily chosen, as it is an undisputed fact that the central visual acuity, peripheric vision and the muscular movements have different meanings in the act of vision, the proportional valuation of which cannot be put into figures from observation nor from measurement, it is certainly allowable for the mathematician or the physician to estimate the amounts of these exponents differently, but the formula itself will not be changed."

The formula, then, for binocular vision is as follows:

$$S^2 = C \sqrt{P} \sqrt[4]{(m_1 m_2 m_3 m_4 m_5 m_6)\ (m'_1 m'_2 m'_3 m'_4 m'_5 m'_6)}$$

In this formula, C is the central visual acuity in the better eye.

The formula for monocular vision, however, is this:

$$S_1 = C \sqrt{\tfrac{5}{6} P} \sqrt[4]{\tfrac{2}{3} (m_1 + m_2 + m_3 + m_4 + m_5 + m_6)}.$$

The fraction $\frac{5}{6}$, standing before P, denotes the fact that the monocular field of vision is $\frac{5}{6}$ as extensive as the binocular. The value of the muscular function is $\frac{1}{3}$ less in monocular than in binocular vision; hence it is estimated at $\frac{2}{3}$ the binocular value.

Economic limitations of C.—The economic limitations of the central visual acuity are not identical with the scientific limitations of the same faculty. This, at first, may sound a trifle startling, yet, on due consideration, we find that the statement is true. Take for instance the downward limitation. Science calls a person blind only when the acuity has entirely disappeared. Economically, however, an individual is blind when the acuity has become so low that the earning power is *nil.* Take, again, the upward limitation. Scientifically, the acuity equals a hundred per cent. only in case the acuity is approximately 20/20. Economically, however, the acuity may equal a hundred per cent. (i. e., permit of plenary earning capacity) although it is only 20/30, 20/40, or even 20/50 or less. Much depends upon the nature of the occupation, of course, some occupations requiring a high, others only a low, degree of central visual acuity in order to the possession of plenary earning power. However, there is hardly any occupation which demands for its full and adequate exercise the possession of scientifically perfect central visual acuity. Generally speaking, we may say that an acuity of 1/20 is the extreme downward limit of useful acuity in any occupation, and 20/30 the extreme upward requirement. Further, the maximum and minimum limits do not have

to exist in both eyes. If one eye possesses a minimum, the other may possess less (even, in fact, as little as absolute zero) and still the acuity of the eyes as a visual whole is up to the minimum requirement. Likewise, if one of the eyes possesses a maximum acuity, the other may possess less (even, in fact, as little as absolute zero) and still the acuity of the eyes as a visual whole is up to the maximum requirement. Magnus and Würdemann divide the different occupations into two groups—those requiring high, and those requiring low, degrees of visual acuity, and specify a rather large number of trades and professions belonging to each group. To each of the groups they assign a maximum and a minimum C. Much as we deplore the inability, we cannot reproduce such matters in this article, on account of lack of space.

The economic limitations of P.—As in the case of C, so also in the case of P, the scientific and the economic standards are not at all the same. In the vast majority of callings, monocular limitations of the field do not impair the earning power. Magnus and Würdemann, following Schroeter, divide the binocular field into three zones of 30° each. The first zone reaches from the outermost periphery to 60°; the second, from 60 to 30°, the third from 30° to the fixation-point. These three zones are not of equal value in certain respects, yet, as what zone 3, for instance, lacks in functional ability, it makes up for by its greater extent, these three zones of P are accorded equal value. By this conception, then, the entire binocular field of vision (exclusive, of course, of what we have represented heretofore by C) consists of three factors of equal value. Thus a loss of one eye entails a loss of ⅙ the binocular field (no more than that, because of the overlapping of the single fields in the binocular) and a homonymous hemianopsia entails a loss of $\frac{3}{6} = \frac{1}{2}$.

Economic limitations of M.—The economic loss (in a person possessed of binocular vision) arising from the impairment of a single ocular muscle is very great indeed, because, diplopia appearing in consequence of the injury, one eye must necessarily be excluded from the visual act, in order that useful vision may be exercised at all. The loss, therefore, economically, is exactly the same as that which results from the destruction of one eye. In case, however, the subject was possessed before the accident of monocular vision only, then a smaller degree of economic loss should be imputed to the impairment of a muscle in the seeing eye. In fact, in such a case, the economic loss is approximately ⅙. However, the six extrinsic muscles do not all possess exactly the same value, at least under any and all circumstances. Thus, for a miner or a compositor, the rectus superior is especially

important; for a sailor, the rectus externus; for a bookkeeper, a jeweler, an oculist, etc., the rectus internus. For people generally, the rectus internus possesses the most value.[1]

Special consideration of the ability to compete (*K*).—When a person's eyes are injured, the damage which has been done to him is frequently two-fold: first, there is the actual impairment of the working ability of the eyes; second, there is a diminution in the injured person's chances of getting or of keeping a job. "Practical experience," for example, "shows that a one-eyed person not only has more difficulty in finding employment,[2] but that in some factories his visual disorder makes it difficult for him to retain his employment. . . . The injured person, therefore, has a right to claim not alone a compensation for the impairment of his capacity for work, but also the difficulty which he encounters in making the most of this capacity." Thus Magnus and Würdemann. The courts, moreover, have begun to sustain this view. Thus the highest tribunal in England, the House of Lords, has, very recently, sustained it. "A workman who had lost the sight of one eye from an accident was subsequently able to obtain work because the defect in his sight had not been observed. As the result, however, of a second accident the blind eye had to be removed and he was thus prevented by the obviousness of the defect from obtaining work. By a majority of two to one the Court [of Appeals] held that the words 'incapacity for work' in the Workmen's Compensation Act must be interpreted strictly, and that the man was not entitled to compensation from his employer for the second accident, because his incapacity for *performing* work was the same after it as before, incapacity for *obtaining* work only being the result of the second accident."[3] The case was taken to the House of Lords, and there the judgment was reversed. ". . . the Lord Chancellor said that in his opinion, in the ordinary and popular meaning of the words, there was incapacity for work when a man had a defect which rendered his work unsalable, in any market reasonably accessible to him, and that in like manner there was partial incapacity when his work was rendered less salable. The opposite view would leave a workman uncompensated for what might be a real and direct consequence of an injury. The case was accordingly remitted to the arbitrator for the assessment of com-

[1] It is only now and then that injuries of the ciliary muscle affect the earning power. By the use of convex lenses, the impairment can, in the vast majority of occupations, be compensated. On this head see *Encyclopédie Francaise d'ophtalmologie,* Paris, 1910, Vol. IX, p. 713.

[2] We may remind ourselves in this connection that the inability to estimate distances and the size of objects, which occurs at once after the loss of an eye, endures but a very short time—certainly in adults not more than six or eight months and in children two or three weeks.

[3] See *"Journal of the American Medical Association,"* June 29, 1912.

pensation." Now, this ability to compete (K) is composed of two elements: 1, the applicant's visual powers; 2, the judgment which the prospective employer will probably form concerning these powers. As to the first of these elements, we express it, in the formula for K, under normal circumstances, exactly as we expressed the normal act of vision (i. e., $C \sqrt{P \sqrt[4]{M}}$), "but in the case of accidents the impaired value of the act of vision should be put in as the lowest value in the root. . . . we have given the reasons for accepting the ability to compete as the lowest value and we have likewise shown that the ability to compete is of less value in the formula for the earning ability E than the other factors, i. e., it has a smaller influence upon the value of E than the others. We have, therefore, adopted the ability to compete, K, as a root value. For, if K be reduced by an impairing of the act of vision, it becomes a proper fraction, for instance, $\frac{K}{Z}$. Now the root of a proper fraction is always greater than the fraction itself; the value of K after the impairment if it is taken as a root value cannot any more be $\frac{K}{Z}$, but it must be greater, for instance, $\frac{2K}{Z}$. By taking K as a root, its value, in the case of a visual impairment, is greater than it would have been if K without root would have been taken into the calculation. And as the amount of the earning ability is directly fixed by the amount of the ability to compete, K exercises less influence upon the earning ability than the other factors, as soon as we insert K as root in the formula for the earning ability. The full formula being:

$$\sqrt[x]{K} = \sqrt[x]{S_2 \sqrt{P \sqrt[4]{m}}}."$$

As to the second of the elements which go to make up K, i. e., the part depending on the judgment of the employer, that part is expressed by the exponent of the root which is chosen for K. "If we think that the esthetic differences between simple blindness of the scientific standard without injury to the looks of the eye and the loss of the eyeball, or, for instance, the formation of a bad-looking eye, as leucoma or staphyloma are greater, we may give expression to our opinion by choosing a great root exponent for the ability to compete in the case of simple blindness without deformity. By leaving the selection of the root exponent to the judgment of the calculator, sufficient room is given to the individual conception of each case; *thus our formula adapts itself to the peculiarities of the individual case and to the judg-*

ment of the physician, avoiding thereby a rigid form and doing justice to both parties.'' In view of the fact that we are often ''in the peculiar position of estimating an ocular impairment of the ability to compete when there is no real defect of working vision,'' (for instance, in the case of a man with a bad-looking leucomatous eye, whose acuity is, say .25, while the fellow eye is absolutely normal) ''we express the diminution of the ability to compete in all cases by the arithmetical proportion of the visual acuity of both eyes.'' In the case of the leucomatous individual just supposed, the numerical expression for the ability to compete would be:

$$\sqrt[10]{\frac{1+0.25}{2}} \sqrt{P} \sqrt[4]{(m_1m_2m_3m_4m_5m_6)\ (m'_1m'_2m'_3m'_4m'_5m'_6)}''$$

Because of lack of space, we cannot here enter into the numerous and ingenious applications of this formula which are furnished by Magnus and Würdemann, though these are extremely interesting and instructive. We can only say, in bidding farewell to the formula in question, that, though such an extremely elaborate hieroglyphic is by no means presentable to a jury, or, indeed, to corporation management, except in isolated instances, yet that the ophthalmo-surgical expert who has mastered the subject of ''visual economics'' and particularly the comprehensively scientific formula which we have been discussing, namely:

$$E = C\ (max.)\ \sqrt{P} \sqrt[4]{M} \sqrt[x]{\frac{C_1 + C_2}{2}} \sqrt{P} \sqrt[4]{M}.$$

will find himself indubitably better able to wrestle with the question as to what degree of economic loss has been sustained by a given person in consequence of some particular injury.

Questions of a general nature relating to the power of vision.

Questions under this head are chiefly these: (1) As to the possibility of recognizing persons [1] and objects under various sorts of cir-

[1] In this connection, the following, extracted from *The Law and The Doctor*, Vol. II, p. 39, may prove interesting: ''* * * the physician, testifying as to the possibility or impossibility of a certain act or thing, should remember that his evidence may be rebutted by testimony of a witness that he has performed the act or accomplished the thing which the expert has testified to be impossible. A case illustrating the pertinence of this suggestion was related to the author some years ago by a lawyer who was present at the trial. Two men had broken into the house of an old couple at night and entered the sleeping-room. The old people were awakened by the noise. The old lady, rising up, took her glasses from the head-board of the bed, and, by their aid, claimed to have recognized the men

cumstances by ordinary daylight; (2) by a gleam of lightning; (3) by the flash of a pistol; (4) by moonlight; (5) by starlight.

1. By ordinary daylight. The perception and also the recognition of persons and things by means of the sense of sight depends on the size of the object, its brilliancy, its distance from the observer, the clarity of the atmosphere, the observer's familiarity with the person or object to be perceived, his position with respect to the sun (i. e., whether gazing squarely or partly toward, or directly away from the sun) the intensity of the illumination which is shed upon the object, and, finally, the acuity of vision on the part of the observer. The ordinary test for the acuity of vision is this: The subject is placed at a distance, generally, of 20 feet (6 metres) from a card, chart, or board, on which are printed lines of isolated letters (i. e., letters unrelated in sense) of varying sizes, all the letters of a given size being printed, as a rule, in one and the same line, and a certain proportionate relationship subsisting between each letter and every other letter on the card. This proportionate relationship is based, according at least to the method most generally employed, upon the principle that the minimum visual angle is precisely one minute. Each letter, in whatever line, is constructed of blocks, or units, each of which subtends, at the distance indicated by the number of the line in which the letter occurs, an angle of exactly one minute. A whole letter subtends, laterally as well as vertically, an angle of 5′, being composed laterally and vertically, of five of the constituent blocks, or units. Now, the line numbered 20 should, as already hinted, be read by the average normal, unassisted eye at a distance of 20 feet—i. e., the distance at which the test is ordinarily conducted. The line numbered 15, is supposed to be read by the same kind of eye at 15 feet; that numbered 10, at 10 feet. The line that bears the number 30 should be read at 30 feet, and so on from line to line of larger and larger type till the line numbered 200 (which is generally the largest used) is reached—a line which should, of course, be read throughout by the average normal, unassisted eye at 200 feet. If the subject reads at a distance of 20 feet the line numbered 20,

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just as they shot and killed the husband. Upon trial of the accused, the defense introduced an oculist who testified that he had examined the eyes of the old lady and the glasses in question, and that it was a physical impossibility for her to recognize a person by the aid of those glasses at the distance at which it was testified the murderers were, as the lenses of the eyes and the glasses could not focus at that point. Counsel for the prosecution, in rebuttal, identified the glasses in question, asked the old lady to take the witness stand, and caused several men, including the accused, to stand in front of her at the distance testified; thereupon he handed her the glasses and asked her to 'pick out the men who shot your husband.' After adjusting the glasses, she peered into the faces of the several men until she came to the accused, when she promptly identified them as the men who had committed the crime.''

we express the vision of that eye thus: Vision (or simply V) = 20/20 (20/20, of course = unity, or normal). If the subject can read with the given eye at 20 feet nothing smaller than the line numbered 30, his vision = 20/30, or ⅔ the normal. If the line numbered 15, then 20/15, or 33⅓ per cent. better than even the average, normal, unassisted eye—a power of vision which is now and then found. Thus, the distance at which the subject reads is always the numerator of the fraction which expresses his visual power, and the number of the line that is read is the denominator. If the sight is normal this fraction = unity (20/20); if less than normal, the fraction is a proper fraction, and, if more than normal, an improper one. The vision of the two eyes together, assuming that the sight of each is fairly good, and that it is much the same in each, as in the other eye, is often a little better (a fraction of a line, in fact) than that of the better eye alone.

Inability to read Snellen's line numbered 20 at a distance of 20 feet (i. e., subnormal acuity) may arise from errors of refraction (which, in almost every instance, are correctable by glasses) by obstruction to the passage of the light through the eye to retina and optic nerve (as by any opacity in the cornea, the aqueous humor, the lens—cataract—or the vitreous body) by pathological conditions of the retina or optic nerve, the optic chiasm, the optic tract, or, finally, the cerebral portion of the visual apparatus.

Assuming, now, that the eye has normal acuity of vision (naturally, or after correction by means of lenses in case subnormal acuity is due to an error of refraction) how far can such an eye (an eye, that is, with 20/20 acuity) perceive a man of ordinary height, out of doors, by ordinary solar illumination? According to various experiments, such an eye perceives an ordinary man, in ordinary attire, on level ground, (assuming the observer himself to be a man of ordinary height, and with the sun not in his eyes) at a distance of 3½ miles. Brilliant attire, exceptional clarity of atmosphere, very abundant sunshine, and unusual stature in either the observer or the observed, may, combined, increase the distance by as much as perhaps a quarter of a mile. On the other hand, dense fog, diminished illumination, rough ground, and diminutive stature in either the observer or the observed, reduce the distance greatly; in fact, a fog alone may reduce it to a very few feet.

Different, indeed, is the power to recognize from the ability merely to discern. Here, also, two new elements come in: First, presence or absence of personal peculiarities in the observed; second, the knowledge or the lack of knowledge concerning these, on the part of the observer. Persons with marked peculiarities can be recognized, in broad daylight, by those who know them well, at 110 yards (100 metres). A person

of marked peculiarities can be recognized by one who knows him only slightly, at 70 to 80 yards. A person devoid of peculiarities can be recognized by a person well acquainted with him, at about 70 or 80 yards. Finally, a person devoid of marked peculiarities can be identified by those who are only slightly acquainted with him, only at the rather surprisingly short distance of 25 to 35 yards.

As to the smallest objects visible to the unassisted eye, it may be observed that lines (not, of course, in the geometrical sense) are more perceivable than are squares, circles, triangles and the like, presenting the same identical extent of surface to the eye. The smallest black square on a white ground, or white square on a black ground, that can be seen by the normal human eye, under ordinary (indoor and indirect) solar illumination, is about the 1/500 of an inch. Brilliant particles, such as grains of gold-dust, can be perceived by the eye even when presenting so little area as 1/1,125 of an inch. "Lines," as stated, are more perceptible than figures more compact. Thus, opaque threads, held between the naked eye and a window can, by ordinary, indirect solar illumination, be discerned though only 1/4,000 inch in diameter.

2. By lightning. The question has arisen, especially in criminal trials, as to the possibility of recognizing a person when the only illumination consists of a gleam of lightning. It arose, for example, in the thread-bare, if also classic, instance of the lady who, returning home from India, declared that she saw distinctly, and could afterward identify, a man who was "robbing her trunk in the cabin of a vessel, on a dark night." Tidy [1] declares "that a flash of lightning is in many cases, but by no means in all, amply sufficient for purposes of identification." Further, that he "was able on one occasion to detect a black hair-pin on the ground by a flash of lightning, and to pick it up when the next flash came."

3. By the flash of firearms. The possibility of recognition by means of the flash of a firearm has also formed the ground of questions asked at a number of criminal trials. On this head there is little satisfactory information, thus far, to be obtained. Cauvet, however, cited by Allen McLane Hamilton,[2] sets forth the following conclusions as having been drawn from experiments conducted by him: "(1) That the person firing a pistol may be recognized if the observer is placed very near him—say five paces—and at the side of the line of fire; (2) that he may be recognized when the discharge has been in a close place of small dimensions, and the observer is in a stooping posture or squat-

[1] Tidy. *Legal Medicine,* New York, 1882, Vol. I, p. 213.
[2] Hamilton (ed.) *A System of Legal Medicine,* New York, 1900, Vol. I, p. 191. (Hamilton gives no further citation than merely the name of Cauvet.)

ting; (3) that the chance of distinguishing the person firing is affected by the quality of the powder employed, the best English powder enabling the observer, when near or by the side of the person firing, both to see and identify him."

4. By moonlight. A person with marked peculiarities, illuminated by the best of moonlight, can be identified by an intimate acquaintance no farther than 16 to 18 yards.

5. By starlight. Under the clearest starlight, however, no farther than 3 to 4 yards.

Flashes of light ("stars" or "sparks") from blows on the head cause no illumination of external objects; they are "subjective" merely. No recognition of persons or things in the external world is, therefore, possible by means of them. The matter would hardly seem to be worth mentioning, but the question has been actually asked of expert witnesses.

The condition of the eye after death.

The special significance of the ocular signs of death arises from the fact that, in lego-medical investigations, it is now and then desirable to determine as nearly as possible the fact of death and, occasionally, the very time of death.[1] In ordinary circumstances, the presence of death is easy enough to make out. Even if a corpse is covered with a sheet, there is something in the posture, or else in the motionless rigidity of the limbs, that tells us almost unmistakably that death is below. Sometimes, however, the diagnosis of death is difficult; then it is that we need the assistance of art.

The signs of death relate to three periods: 1, The stage of transition; 2, the cadaveric state; 3, the stage of putrefactive processes. These terms do not seem to require elucidation.

The signs in the stage of transition (to some extent also in the cadaveric state) have reference to four sets of organs: 1, The circulatory system; 2, the respiratory system; 3, the voluntary muscular system; 4, the eyes.

Only the signs relating to the eyes, of course, concern us here, and further, even these chiefly in the stage of transition.

1. The adnexa. The skin of the lids is pale, of course, as death approaches, or actually sets in, excepting in certain diseases, but this palpebral pallor is of very little value as a sign of death. What about

[1] As a single instance of the necessity which now and then arises for establishing with the utmost accuracy the very moment when death takes place, we may mention the case where the descent of property down one line or another, depends upon the answer to the question of whether A died first or B.

the open or closed condition of the lids? Much discussion has been wasted on this question. The matter as a whole, however, may be summed up thus: In cases of "natural" death (i. e., gradual dissolution as a result of disease) the lids are as a rule, just about half open, both during the stage of transition and also in the cadaveric state. Hence, in fact, the well-known necessity of "closing the eyes of the dead." In cases of drowning, on the other hand, the lids are apt to be puffed (edematous) and more or less tightly closed, while, after sudden death from gun-shot wounds, the lids stand widely apart. To all these rules, however, there are numerous exceptions.

A deep groove, in the cadaveric state, appears between the upper lids and the eyebrows, but this appearance, too, is not to be regarded as a positive sign of death; for it sometimes shows itself when death has clearly not occurred, and, on the other hand, is often absent even when the body as a whole has well advanced into the stage of putrefaction.

2. The globes. The eyeballs, always in the cadaveric state and almost always in the stage of transition, retract, and this sudden or gradual drawing backward of the eyeballs into their sockets, imparts to the death agony one of its most nearly characteristic features. Nevertheless, as a certain sign of death, the retraction of the globes is not at all to be trusted. The phenomenon, in fact, occurs in people who, though very sick, recover, and, on the other hand, in a certain proportion that die, the appearance is either not noticed at all, or else is very slight. In the stage of transition the retraction is due to spasm of the extrinsic muscles; in the cadaveric state, to *rigor mortis* of the same parts. When deferred till the cadaveric state it is one of the earliest symptoms of that condition, for *rigor mortis* almost invariably sets in first either in the heart muscle or in the extrinsic muscles of the eye.

The direction which is given to the globes by the passage from life into death is such that the optic axes are rendered parallel or even a little divergent. This is the "staring into vacancy" of the novelists. This sign, too, is not reliable as an indication of dissolution, because it often occurs in serious illness without death, while, on the other hand, an actual convergence of the visual axes has been observed, though rarely, after undoubted dissolution.

3. The conjunctiva and cornea. These structures become insensible very early in the stage of transition, but, because the same thing happens so often in serious diseases, the sign is absolutely worthless. The cornea, it is barely worth mentioning, retains its sensibility longer than does the conjunctiva.

The thin gelatinous film which forms upon the cornea as a person dies, is one of the more impressive phenomena of dissolution, furnishing indeed, as it does, the most important element of "the finely ruined eyes of death." When this film is seen to form, a person is almost surely dying. And yet, after all, not quite surely, for, as a fact, the same identical phenomenon has been witnessed in the living—for instance, in the course of serious cases of typhoid, of meningitis, and various cerebral affections—who afterward recovered. However, in the living, it is almost always accompanied by the tell-tale symptoms of active inflammation, whereas, in the dying and the dead, the exsanguinated vessels of the sclera and conjunctiva give an opposite account.

The film in question is very delicate and fragile, and easily wiped away. It seems to consist of lymph and other fluids, which exude through the ocular tissues.

Wrinkling of the cornea has also been set up as a characteristic sign of death. It seems to be dependent on the same transudation of intraocular fluids that results in the formation of the corneal film. As a result of this transudation, the intraocular tension diminishes, and so the cornea wrinkles. The wrinkling seldom becomes detectable till the corneal film has pretty plainly formed, hence the sign in question is a characteristic of the cadaveric state rather than the stage of transition. Its value as a sign of death is therefore subordinate.

4. The sclera. The lethal discoloration of the sclera has been alleged (like all the other ocular manifestations of dissolution) to be an absolutely certain sign of death. This sign, however, considered alone, is worth but little more than any of the other signs, perhaps not quite so much as some of them. It possesses the advantage (which is also in some respects a disadvantage) of appearing very early. In fact, in cholera patients it appears as early as eight hours prior to death. It consists of a blackish discoloration, which first appears in the outer scleral triangle, i. e., the space which lies between the outer margin of the cornea and the two lid margins as far as the outer canthus. Next it appears in the inner scleral triangle. Finally, it forms in the portion of the sclera that is covered by the upper, and then in that which is covered by the lower lid. It appears more rapidly and more certainly in a warm than in a cold room, and is very often seen in those who die of phthisis pulmonalis and typhoid fever. It is said to consist partly of subconjunctival ecchymosis and partly of choroidal pigment. Its nature, in fact, has never been exactly determined.

5. The iris. When a person dies, does his pupil contract or dilate? The question would seem to be a simple one, and one very easy to

answer. Nevertheless, a great deal of bitter controversy has been waged about this easy-seeming inquiry. We cannot here afford to revive a discussion which has never appeared to be profitable, and which, besides, has given excellent proofs of its own dissolution. However, it seems to be pretty well settled that, at the very moment of death, the pupil, in the vast majority of cases, dilates. This dilatation, however, continues for a few hours only; with the setting in of *rigor mortis,* the pupil contracts. For one hour after death the pupil responds to eserin and atropin; but not for any longer time. It responds to galvanism, in many cases, for as long as five hours.

6. The fundus. If, at the time of death, or a little while thereafter, the gelatinous film upon the cornea be removed by first moistening it and then wiping it away, the ophthalmoscope can be employed to some advantage. By means of this instrument it has been determined that, at the moment of death, sudden and very striking alterations take place in various portions of the fundus. The papilla becomes anemic, as it were in a flash, and the reddish color of the remainder of the field turns from the normal red or pink almost as suddenly to a sickly yellow. The arteries disappear entirely, and the veins become much smaller, and rather irregular and broken. In all this, however, there is nothing absolutely declaratory of death; similar conditions have been observed in syncope and lethargy.

Is there, then, no ocular symptom at all that will serve as an indisputable sign of death? There is absolutely none. However, when taken as a whole, the ocular signs of death are well-nigh incontestable, especially when supported by tests of general character, such, for instance, as failure of the heart and lungs to respond to stethoscopic examination, and failure of a finger to become cyanotic after a ligature has been tightly placed around it. Still more certain, of course, are such signs as general *rigor mortis,* cooling and suggillation (post-mortem lividity) while, as an absolutely undeniable indication of death, comes putrefaction.[1]

Post-mortem optograms.—Among the laity there obtains a belief that the retinas of those who have perished by assassination retain for some time a photographic image of such persons as last appeared before the eyes of these murdered people. A large number of motion-picture plots have, in fact, been built upon this conception. In this idea, however, there is only the merest shadow of an atom of truth. Vernois (in 1870) having made some photographs of a murdered man's

[1] Perhaps it may be as well to remind ourselves that the earliest sign of decay is a spot of green on the belly, generally in the neighborhood of the umbilicus. Of the internal organs, the liver is, as a rule, the first to decay, the uterus the last.

retina, thought that his pictures exhibited the figures of a man and a dog in the very attitude and posture of attack. These photographs he displayed with some pride to the Society of Legal Medicine in France, and, in fact, to many other physicians in other places; but, unfortunately, he never quite succeeded in getting any other medical person to believe that the pictures represented a man and a dog. In fact the pictures, if such they were, were altogether too vague and indefinite to be of any practical service in the detection of evil-doers.

Kühne, of Heidelberg, later placed gratings in front of rabbits, then killed the rabbits very suddenly and, without any delay whatever, proceeded to make a photograph of the retinas of these animals. Very distinct pictures of the gratings were in some cases secured. However, the killing of the animals had to be practically instantaneous, and the making of the photographs well-nigh as rapid. A man who, by methods such as these, could make successful pictures of murdered people's retinas would have to be upon the scene in ample time to catch the murderer by a very much simpler plan.

The ocular signs of sleep.

Sleep is sometimes simulated, but the fraud is easily found out. The eyeballs in genuine sleep, for one thing, are nearly always absolutely motionless, whereas, when the sleep is only feigned, the globes are seen to move about a little beneath the closed lids. If an upper lid be lifted, the fact will be observed, in genuine sleep, that the pupils are very small, while, as the subject wakens, the pupils dilate extremely wide, even in the presence of strong light.

Ocular indications of poisoning, burning, etc.

The effects of the commoner poisons on the eye may be very briefly stated as follows:

Alcohol.—Conjunctival injection and swelling, both in acute and in chronic poisoning. In chronic poisoning, there is present, in addition, a paresis of the *orbicularis palpebrarum,* combined with anesthesia of the cornea, so that involuntary winking is almost entirely abolished; hence, "the fixed, unwinking stare" of the hard drinker, when sober as well as when drunk.

Arsenate of copper.—This chemical is employed in the manufacture of artificial flowers, confectionery and in fancy baking. The ocular symptoms produced by this substance in those who work therewith habitually, are conjunctivitis and swelling of the lids.

Belladonna and atropin.—Swelling of the lids, excessive lustre of

the corneæ, mydriasis, and paralysis of the accommodation. Exophthalmia has been observed, as a result, no doubt, of paresis or paralysis of the recti, together with a similar condition of the orbicularis, permitting the lids to be widely separated by the forward-pushing globe.

Chloral hydrate.—The prolonged employment of this drug produces conjunctivitis and severe itching of the lids, inside and out.

Chloroform and ether.—During the stage of excitement, pupillary dilatation. Thereafter, progressive pupillary contraction. In the "surgical state" the pupils are immobile, as well as contracted.

Curare.—Exophthalmia, conjunctivitis, and excessive lacrimation.

Digitalis.—Exophthalmia, together with fixity of the visual axes and conjunctival injection.

Illuminating gas.[1]—Diminution of visual acuity, with contraction of the visual field; dilatation of the retinal veins and contraction of the arteries. Persistent bilateral hemianopsia after recovery, has been recorded. There is sometimes paralysis of the various ocular muscles, extrinsic and intrinsic, accompanied or unaccompanied by exophthalmia. When the recti are paralysed, there is always exophthalmia.

Naphthol-B.—When used for a considerable length of time, even externally, this drug not infrequently produces cataract and various alterations in the choroid and retina.

Nicotin.—Exophthalmia and corneal brilliancy.

Opium and its alkaloids.—Myosis and spasm of the accommodation, together with dimness of the cornea—producing the so-called "fishy" look.

Prussic acid.—Exophthalmia and diplopia. After death, the eyes are fixed, prominent and wide open, and are possessed, furthermore, of a singularly life-like expression.

Quinine.—This drug sometimes, in excessive doses, produces a peculiar fundus condition known as "quinine amaurosis." There is extreme contraction of the retinal arteries, and the papilla is very white. Recovery not infrequently occurs, but there is often a permanent peripheral contraction of the visual field.

Strychnin.—Prominence of the eyes and fixity of the visual axes, especially during the convulsions.

Thyroid gland.—Optic neuritis, followed by optic atrophy.

Burning—After extraocular burns, the following ocular symptoms

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[1] "Nearly one-half of the accidental poisonings in New York City in 1888-92 were by illuminating gas, and the same agent was used by suicides more frequently than any other except paris green and 'rat poison.' "—R. A. Witthaus in Witthaus and Becker's "*Medical Jurisprudence, Forensic Medicine, and Toxicology,*" New York, 1896, Vol. IV, p. 848.

have been noted: retinitis, chorio-retinitis, retinal hemorrhages, neuritis and optic atrophy.

Hanging.—Puffing and blueness of the eyelids, exophthalmia, and conjunctival injection. Punctate ecchymoses of the conjunctiva have been observed, but not at all so frequently as after strangulation and suffocation.

Strangulation and suffocation.—Before death: The eyes are livid and prominent and there are often hemorrhages from the conjunctivæ. Subjectively, the vision is lost soon after the beginning of the process. After death: Exophthalmos, redness of the conjunctivæ, and minute conjunctival ecchymoses. The punctulation of the conjunctiva is said to be well-nigh characteristic.

The ocular signs of identity.

Rather often, sometimes even in the dead, the eyes and their adnexa afford most valuable indications of identity. These indications may be classified as (1) anatomical, (2) pathological, (3) professional.

1. *The anatomical signs.*—These relate to the brows and lashes, the lids, the irides, and the sclerotics.

The *brows* are seldom characteristic of the individual, but they often afford some slight indications of identity. Thus, as to the matter of color and texture, it is well known that the structures in question vary from blond to black and from silky-fine to exceedingly harsh and coarse. Years do not so often or so early alter the color of the brows as they do the hair of the head. As to form, in some individuals the brows are straight, in others arched; when arched, they take, in some, a downward inclination at the outer ends, in others, an upward. In some persons they unite at the root of the nose to form one single band.

Changes in the color of the hair often occur naturally. Children's hair gets darker with increasing age, while the hair of adults gets lighter.

The eyebrows and lashes, as well as the head-hair, are now and then colored artificially by those who desire to conceal their identity. Oftenest employed for the purpose are the salts of lead, silver and bismuth, in solution. The changes in color are due to the combination of these metals with the natural sulphur in the hair, forming the dark metallic sulphides. Lampblack, rubbed up with some fatty substance, is now and then used as a hair-dye.

The fact of artificial coloration of the hair is, as a rule, very easily detected. If lampblack has been used, washing the hair with ether will readily expose both the fraud and the natural color of the

hair, since, when the ether dissolves the fatty substance which acts as a menstruum for the dye, the dye is no longer adherent to the hair, but comes away in the ether, leaving the hair in much its natural condition.

To detect the presence of a metallic dye, wash the hair in slightly acidulated water; then test the water chemically for the presence of the metals above-mentioned—lead, silver, and bismuth.

The microscope is often useful for the detection of artificial coloration of the hair. If fatty pigments have been employed, the microscope reveals the presence of the fatty particles plainly. Sometimes, too, this instrument shows places on the individual hair which the dye has failed to affect.

The *lashes* are naturally pigmented either exactly like the brows and the head-hair, or just a little lighter. They are dyed artificially in the same way as the brows and the head-hair, and the fraud is, of course, detected in precisely the same manner.

The *lids* afford a variety of signs. Thus, age is often indicated, approximately, by the wrinkling of the lids, especially at the outer canthi ("crow's feet") and by the puffing of the lower lid especially ("money-bags"). The skin of the lids also thickens with age, and becomes in color brownish or yellowish.

The *iris* is in infants nearly always of a light blue. In later childhood, however, it assumes the particular color which it is to retain throughout the whole life, excepting in senility, when the color again becomes perhaps a trifle lighter.

Congenital anomalies of the irides, the chief of which are colobomata, heterophthalmos (difference in hue of the irides in the same person) have been considered in a former portion of this article. Suffice it here to remind ourselves that such distinguishing peculiarities are possessed of the utmost value as a means of establishing identity.

The *sclera* is in some persons yellow, in others bluish-white, in still others clear white. These differences are often racial; thus, the Jews are noted for the perfect albugineity of their scleræ. Some persons possess, congenitally, spots of pigment in their scleræ, and these, of course, possess much value as a means of identification.

2. *The pathological signs.*—It would be improper to attempt to mention all the pathological conditions in the various ocular structures which, on occasion, could become of greater or less service in the establishment of identity. The chief pathologic signs, however, are the following: Scars of all sorts in the skin of the lids and brows;[1] se-

[1] Including, of course, the tattoos produced by explosions of fire-damp and of gun-powder. On the methods whereby these important kinds of tattoos may be

baceous cysts; slit canaliculi; cicatricial conjunctivæ, resulting from trachoma; pinguecula; pterygium; cataract; the characteristic scars produced by the various bulbar operations; and, finally, the numerous pathological appearances of the fundus.

We ought to add that lashes and brows—as well as the hair of the head—have not turned white from grief or fear in a single night,[1] and, further, that hair is often much darker on its return after loss during typhoid fever and other infectious diseases.

3. *Professional signs.*—The chief of these relate to the various sorts of dust produced in the work of different occupations, and which cling to lashes and brows, sometimes in spite of repeated washings. Thus, for instance, coal-miners, chimney-sweeps, firemen, engineers, and coal-heavers exhibit a dusting and staining of the brows and lashes by coal or soot; locksmiths show on the same parts a dust composed of copper filings; blacksmiths have reddened scleræ and numerous minute scars on corneæ and lids; millers and bakers carry flour in the same situation, while marble-cutters and stone-breakers exhibit, as is well known, on brows and lashes, a plentiful quantity of siliceous dust. There are many other occupations which leave a characteristic powder on the hairs about the eye, even the names of which it is not necessary to mention. We should not forget, however, in this connection, the tanned and thickened skin and yellowed and thickened conjunctivæ of outdoor workers, as well as the special liability of such persons to pinguecula and pterygium.

III.

OPHTHALMO-SANITARY LEGISLATION.

Ophthalmo-sanitary laws in the United States.

The laws enacted for the prevention of injuries to, and diseases of the eye, are, in any country, "few and far between." Nevertheless,

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distinguished, see that division of this article, entitled "The commoner injuries with which the ophthalmo-surgical expert has to deal."

The tattooing produced by explosions of fire-damp occurs not only in the skin of the lids, but also on the conjunctiva of the palpebral, as well as the bulbar portion. Thus, I had, at the time of writing this paragraph, under treatment, a coal-miner, on the inner surface of whose right lower eyelid were plainly visible several characteristic marks (ancient) produced by fire-damp explosions. There was not a single spot of the sort in any other part of the eye, or of the fellow eye, or even on the face or head. It would be quite possible to assert, with a high degree of certainty, merely on the strength of these tiny marks, that the subject was a coal-miner.

[1] Hair has now and then *appeared* to turn white in a very brief space of time. Thus, in a case that was known to the present writer, a lady, on the loss of her daughter, decided to give up the "vanity" of dyeing her hair. When next she

such laws exist, and are most conveniently divisible, as regards America at least, in these two main classes:

1. Laws devoted solely to the prevention of injuries to, and diseases of, the eyes.

2. Laws which, though embracing other matters, nevertheless contribute partly or indirectly toward the prevention of such injuries and diseases.

Neither of these kinds of laws can here be treated *in extenso.*

(1.) Among the most important of the first named enactments are those relating to the prevention of blindness from *ophthalmia neonatorum.* These are of Cleopatra-like variety—long, short, foolish, wise, and every one imperfect. The first jurisdiction in which a law of the character in question was passed was Maine (in 1891—precisely ten years after the announcement by Credé of his marvelous discovery [1]). New York followed in 1892 (April 18) and, on the next succeeding day (April 19) Rhode Island became a portion of the goodly company. In 1893 Minnesota, and, in 1894, Ohio and Maryland, fell in line. Eighteen ninety-five was a veritable *annus mirabilis,* no fewer than six states passing ophthalmia neonatorum laws within that twelvemonth—a record which was only equalled in 1911. Today there is hardly a state in the Union which does not show some law, either good or bad, workable or unworkable, on its statute books or session laws with respect to the disease in question. But the quality of these laws? That is a different matter. There is, however, scarcely a single law which does not show forth some valuable provision. On the other hand, there is scarcely a statute which does not show some serious hiatus or fundamental misconception of the very situation which it is the object of the law to improve. Some statutes place the entire matter in the hands of the State Board of Health. Others are founded wholly upon the very mistaken supposition that blindness from the disease in question is forever and eternally due to a fault on the part of an ignorant midwife. Others require, and properly, that physician or midwife, whichever has been in attendance at the birth, shall report all cases of "inflammation of the eyes" to a public official—for example, "the parish health officer," the drawer of the bill having apparently believed that, the case once "reported," the eyes would get well of themselves. The most important provision of all is, in fact, almost universally omitted—i. e., the provision that whoever presides at a birth—

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presented herself among her friends her hair was the color it really had been for many years—*i. e.,* snow white. However, the lady in question at once (though innocently) acquired the reputation of having become white-headed through grief in a single night.

[1] See, in this *Encyclopedia,* **Credé, Karl Siegmund Franz.**

whether midwife or physician—shall *use the Credé drops, and thus render unnecessary the making of any sort or kind of report or the institution of any other sort or kind of treatment.*

For a thorough discussion of the laws relating to ophthalmia neonatorum, as well as for a model law, the reader is referred to an article by Dr. Frank Allport in this *Encyclopedia,* entitled **Ophthalmia neonatorum.**[1] See, also, **Blindness, Prevention of, Conservation of vision** and other pertinent headings in this *Encyclopedia.*

Leaving the subject of ophthalmia neonatorum, about which very much more could be said, here is a very useful Connecticut statute, which, so far as I know, has never been copied into the laws of any other state.[2] "Every person, firm or corporation using *stained, painted, or corrugated glass in factory windows,* where the same is injurious to the eyes of the workmen therein, shall remove the same upon the order of the factory inspector."

The various laws requiring the use of *blowers, hoods, etc., in connection with polishing machines, etc.,* have in view almost exclusively the protection of the eyes. Nearly all the states possess such laws at present, and, of these, the following from New Jersey may very well stand as typical:[3] "Sec. 14. All corporations, firms or persons conducting a manufacturing business . . . where emery wheels or emery belts of any description are used, either solid emery, leather, leather covered, felt, canvas, linen, paper, cotton, or wheels or belts rolled or coated with emery or corundum or cotton wheels used as buffs, shall provide the same with blowers or similar apparatus, which shall be placed over, beside or under wheels or belts in such a manner as to protect the person or persons using the same from the particles of the dust produced and caused thereby, and to carry away the dust arising from or thrown off by such wheels or belts while in operation, directly to the outside of the building, or to some receptacle placed so as to receive and confine such dust . . .

"Sec. 15. . . . Each and every such wheel shall be fitted with a sheet or cast-iron hood or hopper of such form and so applied to such wheel or wheels that the dust or refuse therefrom will fall from such wheels or will be thrown into such hood or hopper by centrifugal force and be carried off by a current of air into a suction pipe attached to some hood or hopper." See, also, **Blindness, Prevention of.**

Thus much for the legal enactments in the United States tending

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[1] Also to an article by the same writer in *Ophthalmology,* for January, 1916.

[2] *General Statutes,* 1902, sec. 4518.

[3] *Acts of 1904,* chap. 64, secs. 14 and 15. (Several of the immediately succeeding sections are also interesting in the present connection.)

toward the prevention of ocular injuries and diseases; and, truly, by any one who investigates this class of our legislation at all thoroughly, it is readily perceived that in this country there exists a very great need of further determinate ophthalmo-sanitary legislation. For instance, *the sale of explosives for use on the Fourth of July and other holidays* should be much more carefully restricted, or, still better, should be prohibited entirely. At present, nearly all such matters are left to local ordinance, whereas each state should enact a statute on the subject, and every state prosecutor should see that the law is strictly enforced within his territorial jurisdiction. A civil statute, making the seller of explosives to persons under age answerable in damages for all injuries resulting from such sale, would exert, beyond question, an extremely deterrent effect. Such a law, for one thing, would not depend for its enforcement on the vigilance of public prosecutors.

Still another matter vainly demanding legislative attention is *the fitting of glasses by incompetent persons.* It is not perhaps an exaggeration to say that nine-tenths of all the glasses fitted, or misfitted, in this country are obtained from the hands of grossly ignorant men, persons who are not physicians in any sense whatever and who have never received even the slightest medical training. Each of these incompetent persons almost invariably makes himself known throughout the community as "eye-doctor," "eye-specialist," "ophthalmologist," and the like, by which misnomers he succeeds in leading the public to suppose that he is a physician paying especial attention to diseases of the eye. Unfortunately, legislators, forgetting that the only possible justification for the narrowness of specialism is the broadest possible preliminary training in the different general medical branches (from which no specialty can properly be dissevered, except in the field of actual practice) are generally, in fact almost universally, disposed to regard the treatment of eye-troubles by those who are only spectacle-fitters as merely a further and praiseworthy development of the modern idea of specialism. The consequence is that legislation, instead of tending to oust these people from ophthalmic practice, tends yearly more and more firmly to establish them therein. A number of states now have legislation, the object of which is to fence about and safeguard these unqualified practitioners. On the other hand, the medical profession (inclusive of ophthalmologists) seems to have gone sound asleep upon this subject. Many family practitioners, in fact, actually refer their "spectacle work" to the most outrageous quacks, and do so as a matter of routine.[1]

[1] In an excellent paper by Dr. James A. Spalding, of Portland, Maine, read at the meeting of the Maine Medical Association, July 1, 1913, entitled "The

Then another affair demanding attention, but very unlikely to get it, is *the continual sale in enormous quantities of eye-drops, eye-salves, eye-batteries, and the like,* not only by respectable pharmacists, but also by "wheeling strangers of here and everywhere."[1] In towns of considerable size the institution should be insisted upon of *strictly prescription drug-stores,* i. e., those which do not deal in fraudulent medicines. Then all the physicians in the town should send their prescriptions to such stores.

Another deficiency in American ophthalmo-sanitary legislation lies

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Eye: Its Connection with Diseases and Injuries of the Body," occurs the following very relevant passage: "Hundreds of books and thousands of papers have been written in the past, and will continue to be written so long as life endures upon this world, on the interdependence of the eye, and diseases and injuries of the body. For all that, the legislature of Maine saw fit four years ago to set its denial upon this well-known truth, and to assert that there was no connection between the organ of sight and the human body. It will forever remain a source of regret that such an ignorant law should have been passed, but politics, money, a powerful and persistent lobby overpowered our small band of protesting physicians. So far, under this law, nothing has been gained for the people, the medical profession has lost ground, and ignorant, uneducated men are allowed to practise one branch of pure, absolute medicine as they see fit. The certificates under which they carry on this practice flaunt in the face of the public the false assertion of 'examinations of fitness,' that have never been passed, and in the four years of the presence of this useless law upon our statute books, not a single educated man has been added to the ranks of the exempt and often unfit." In the experience of the present writer a lawyer member of the legislature can often be reached (during the pendency of an "optometry" bill) by the following argument: What would you think if I were to offer in this legislature, seriously, a bill proposing that persons who have never secured a license to practice law, should be permitted to practice real estate law, or personal injury law, or probate law, or patent law, or any other legal specialty, only after six weeks or two or three months of study, of these branches alone and the passing of a so-called "examination" before a board, not one member of which was a lawyer or had ever secured a license to practice law? The answer always is, in effect: I would think you did not understand that no one can practice properly a legal specialty who has not received an all-round legal training. Then I answer: This same principle is true in medicine—with, however, a very important difference, namely, that he who loses me my patent or my farm, loses me what, comparatively speaking, is "trash," while he who loses me my vision or my life has made me "poor indeed."

[1] The subject of the graduate optician (who not infrequently fits glasses for nephritic retinitis, ocular syphilis, etc., until the time when a cure could be effected has forever gone by) the prescribing pharmacist, and the wheeling stranger will *not* be considered hereafter in connection with the laws of other countries. Suffice it to say that, in every civilized land on earth, so far at least as the writer has been able to ascertain, the wail for reform in these matters goes up to heaven continually and vainly. *Populus vult decipi.* Thus, for a single example, take poor France, as voiced by Chevallereau in the *Encyclopédie française d'ophtalmologie,* Vol. IX, p. 777: "Notre domaine, que d'aucuns trouvent et avec raison déjà bien étroit, est constamment envahi par un grand nombre de braconniers qui exercent sur nos terres de véritables brigandages. Les pommades et les eaux pour les yeux sont vendus par un grand nombre de pharmaciens, qui, ici comme toujours, se trouvent aux premiers rangs de nos concurrents; les sœurs de l'hôpital de Saint-Germain-en Laye vendent une eau qui guérit la cataracte; un restaurant situé près de la Bastille donne à qui en désire l'eau des Quatre-Sergents qui guérit tout. Ces exemples sont pris entre plusieurs mille.

"L'humeur de nos confrères s'est surtout élevée depuis quelques années contre les opticiens qui ne se bornent pas à exécuter nos ordonnances, mais prescrivent d'eux-mêmes et fournissent des verres pour tous les genres de réfraction * * *."

in the fact that in only seventeen states of all our forty-eight, have statutes been enacted, looking toward the establishment of *medical inspection of public school children.*[1] The states in question are: Connecticut (1899, with reference to the children's eyes alone), Massachusetts (1906, with reference to both sight and hearing), Colorado (1909, covering the eye, ear, nose and throat), Maine, Pennsylvania, Indiana, Utah, Vermont, North Dakota, West Virginia, New Hampshire, New Jersey, New York, Maryland, Wyoming, Delaware, Rhode Island. Of all the defects found in school children in this and in European countries, those of vision are by far the most numerous; hence the importance from the ophthalmic viewpoint of inspection in the public schools. Just as in the case of the laws relating to ophthalmia neonatorum, the school inspection laws are of Cleopatra-like variety—practical and impractical; serious and humorous, serio-comic and absolutely farcical. Tests for poor vision and poor hearing are, in some of the states, made by the teacher, yet, nevertheless, much good has been accomplished. Nowhere in the United States, so far as I know, are provisions made for the institution of separate classes for children with defective sight—like the *Nebenklassen* of the Germans—or separate schools for children suffering from trachoma[2]—such as exist in Italy.[3]

Every state should, as a matter of course, provide for medical inspection of its public schools, both by general practitioners and by specialists. The provisions should be absolutely mandatory and state wide in their application. Then, too, although much should, as a matter of expediency and perhaps necessity, be left to the conscience and

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[1] To be sure, a little has been done, here and there, by virtue of local powers. Thus, school nurses have throughout the country been installed in the public schools of some of our larger cities—always, by the way, with excellent results. See on this head The Value of the Nurse in the Public School, by Thomas A. Woodruff, M. D., Chicago, in the *Bulletin of the American Academy of Medicine,* Vol. X, No. 5, Oct., 1909. A case in Minnesota holds that school boards can enforce medical inspection by virtue of their general powers—i. e., regardless of the existence or non-existence of a statute. The reason given was that "no system of education, although designed solely to develop mentality, would be complete which ignored bodily health." (State *er rel.* Stoltenberg *vs.* Brown, City Comptroller, 128 N. W. R. 294.)

[2] For an example of what can be done where proper intelligence and determination exist, the reader is referred to an article by F. W. Carruth, entitled A Municipal Crusade Against Trachoma, *No. Am. Rev.,* 177: 766-74. This crusade was nobly led by Dr. Richard Derby and Dr. Ernst J. Lederle.

[3] An excellent article on The Medical Inspection of Public School Children is that by Dr. G. W. Rice, of Champaign, Ill., in the *Illinois Medical Journal,* for March, 1910, p. 328. Another is that by Dr. Frank Allport in *Ophthalmology,* for July, 1915, entitled State Legislation Concerning the Examination of School Children's Eyes, Ears, Noses and Throats. Good books on the subject are: Kelynack, *Medical Examination of Schools and Scholars* (London, 1910); Steven, *Medical Supervision in Schools* (London, 1910); Cornell, *Health and Medical Inspection of School Children* (Phila., 1912).

discretion of teachers and inspectors, yet very much might well enough be made a matter of certainty by hard and fast rules. Thus. Javal's dictum that buildings surrounding a schoolhouse should not stand closer to the school than twice their altitude, might very well be insisted on in every case. Again, such matters as temperature and ventilation might be the subject of fixed rules. Inspectors should be required, under appropriate penalties, to see that cards are issued to parents, directing the latter's attention to any defects of a physical nature occurring in their children. Monthly inspections should be required [1] and the occurrence of contagious diseases should be a signal, always, for the removal of the afflicted scholar, or scholars, until such time as his or their reappearance could be made without danger to other persons. School books should be printed in type neither above nor below certain standards of size, and on paper absolutely opaque and of a dull finish. Larger sized type should be required for the younger children and for the bodies of the pages than for older students and foot-notes.[2] In towns of a thousand or more inhabitants there should be separate schools, or classes, for children with defective vision—less, say, than 1/5. Indigent children needing glasses should have these furnished at the public expense.[3] As to school furniture, the front edge of the seat should be required to extend not less than 2 nor more than 4 inches forward of the back edge of the desk; the seat should be at an approximate distance from the desk of ⅛ the pupil's height; the top surface of the desk should be inclined in the direction of the pupil at an angle of 15° to 20°; and certain other regulations relative to school furniture, not possible to be mentioned here, should be made the subject of statutory enactment. Finally, in towns or cities with populations exceeding ten thousand, school nurses should be employed, and should be vested with appropriate and adequate authority.[4]

(2.) Laws which only indirectly, or partly, have for their object the prevention of eye diseases and injuries.[5]

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[1] Our active little neighbor across the Pacific got round to this many years ago.

[2] The ophthalmic section of the American Medical Association should, in fact, draft a circular to be sent to every publisher of books of any sort or kind within this country, suggesting (with reasons) that the use of glossy papers in books be discontinued, saving and excepting solely when the presence of half-tones renders the employment of glossy paper indispensable. Suggestions should also be made with regard to "leading" and to the size of type, both for body-work and for footnotes. Publishers are exceedingly careless with regard to these matters, particularly with regard to the unnecessary use of glossy papers.

[3] By which I do not mean at the expense of some individual oculist.

[4] For a full discussion of the general subject, as well as a model law, see, in this *Encyclopedia*, **Medical Inspection of School Children**, also **Conservation of Vision.**

[5] Unfortunately, the employer's liability law which has been enacted in Germany (das Unfallversicherungsgesetz) and, with certain modifications, in various

Of these the most important by far are those relating to vaccination, since *variola* is extremely prolific of blindness, even in mild cases of the disease. It would be superfluous to mention the various requirements in the several states [1] relating to the vaccination of school children, but it is well worth knowing that, in Connecticut, Maine, and Virginia, laws are in force which require the vaccination of workmen under certain (generally too limited) circumstances.

Maine has the most explicit law on the subject, but restricts its application to paper mills. Thus: [2] "Sec. 83. No owner, agent or superintendent of any paper mill where domestic or foreign rags are used in the manufacture of paper shall hire or admit any person to work in or about said mill who has not been successfully vaccinated or revaccinated within two years, or to the satisfaction of the local board of health.

"Sec. 84. No person shall work in or about any paper mill where rags are used, who has not been successfully vaccinated or revaccinated within two years, or to the satisfaction of the local board of health."

The fine for violation of either of these provisions is restricted to a maximum of fifty dollars. Moreover, there is no minimum limit whatever, and the fines are almost always too light. It is easy enough to see why the employes in and about paper mills should be the especial objects of vaccinial legislation, but, certainly, the law should be extended so as to apply to many other classes of workmen.

Connecticut's law upon the subject is also limited in its application to paper-mill employes. Further, it is altogether too short and unexplicit.[3]

Virginia limits the application of her vaccination statute [4] to "Any

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other lands (England, France, *et al.*) has never been copied, except as to a few of its features, into the laws of the United States or of those of any of the separate States. This law (Unfallversicherungsgesetz) which makes the employer liable at all events, (*i. e.*, irrespective of such questions as contributory negligence, fault of fellow-workmen, assumption of risk, etc.), for accidents to his employes, has had a most excellent effect in the way of preventing injuries to workmen; for, when employers know themselves to be responsible for such injuries at all events they take the utmost pains to prevent the occurrence of accidents. On the other hand, in some of the United States (a nation of extremes) the Workmen's Compensation Act has been a source of oppression to employers.

For an excellent and somewhat copious discussion of this subject, the reader is referred to the series of articles by Dr. W. H. Allport, of Chicago, in the *Illinois Medical Journal*, for Oct., Nov. and Dec., 1909, entitled Studies in Contemporary Workmen's Compensation.

[1] Once again, however, nothing at all seems able to "stale" their "infinite variety." A uniform and comprehensive law is badly needed. The right of the various state legislatures to enact compulsory vaccination laws, was upheld in Jacobson *vs.* Massachusetts (197 U. S., 11).

[2] *Revised Statutes*, 1903, Chap. 18.

[3] *General Statutes*, 1902, Sec. 4693.

[4] *Code*, 1904, Sec. 1743e.

person, firm or corporation employing large bodies of laborers in the state of Virginia constructing works of public improvement. . . .''

The laws of the United States and also of the separate states comprise, nevertheless, a rather large number of provisions, the object of which is, at least in part, to prevent the occurrence of injuries to, and diseases of, the eye. Thus, in some states, the shuttles which shoot to and fro in weaving mills must be guarded from flying out of the looms —which, by the way, they sometimes do at all events, often with disastrous consequences to the eyes of those who are working near. Threshing machines, also, are generally required to be so protected that no ''joint, knuckle, or jack'' thereof, ''is dangerously exposed.'' Persons charging any ''hole with nitroglycerin, powder, or other explosive'' are usually forbidden to ''use any steel or iron tamping bar.'' Professional shot-firers are quite uniformly required to shoot down the coal in mines ''employing'' for instance ''twenty or more miners to work in the same.'' The various regulations requiring an adequate supply of outer air in mines, both for breathing purposes and also for the prevention of explosions due to the accumulation of fire-damp, those, also, providing for a sufficient number of adequate escape shafts, for improved safety catches, for ''experienced, competent, and sober men'' to have ''charge of hoisting apparatus and engines''—all these and many similar regulations have a tendency to prevent the occurrence of injuries to the eyes as well as to other portions of the body. Then there are numerous regulations relating to railways, steamboats, steamships, the construction of buildings, etc., which cannot here even be mentioned by title, partly because of lack of space, partly because of the high degree of technicality of many of the matters involved. The necessary laws relating to the manufacture of wood alcohol (a substance productive of often incurable blindness) are yet to be enacted. (See, upon this head, **Wood alcohol**; **Columbian spirits**; **Alcohol, Methyl**; **Methyl alcohol** and **Toxic amblyopia**, in this *Encyclopedia.*)

Before we leave this subject we ought to remind ourselves that all the various laws which tend to shorten the hours of labor, and which limit or prevent the improper employment of women and children in industrial occupations are all—so far as enforced—of a very high degree of value not only in the prevention of diseases and accidents generally, but also of those which, either directly or indirectly, have reference to the eye.[1]

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[1] A nondescript matter of some importance to ophthalmologists may here, though slightly irrelevant, be mentioned, because it belongs still less within the

OPHTHALMIC JURISPRUDENCE

Passing to the ophthalmo-sanitary regulations prevailing in other countries than our own we first consider the

Ophthalmo-sanitary laws of England.

First of all, there exists in England, as already suggested in a foot-note to this article, a Workmen's Compensation Act (1906) by which is placed upon all employers a tremendous pecuniary responsibility for the safety of their men. One effect, among many,[1] of this act, has been to diminish in a most remarkable degree the number of accidents to laboring men in England. The act provides for compensation not only after industrial accidents, but also in case of the development of certain specified industrial diseases, for example miner's nystagmus and bottle-maker's cataract. In addition to this splendid piece of legislation, there exists a "Factories and Workshops Act" (1901) which has also proved beneficial. It prescribes, among other matters, that every factory must be clean, have a certain amount of air-space for employees, provide adequate ventilation, be of proper temperature, and possess adequate and appropriate sanitary accommodation. There are special regulations relating to all persons working in poisonous substances or in conditions dangerous by reason of steam, machinery, fumes, etc.

With regard to vaccination, there is ample provision for this in

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scope of any of the other main divisions of this article. I refer to the drawing of wills for the blind. The fact of the testator's blindness should plainly be noted in what is called the attestation clause—i. e., a brief passage which stands at the close of the will, and which is signed by the witnesses. A proper attestation clause for the will of a blind person, good in any state, is the following: "The foregoing instrument, consisting of.....sheet.., was, on this..... day of....., nineteen hundred and....., *first read over to the testator in our presence, he (or she) being blind, and was then, upon the said date, and forthwith,* signed, sealed, published and declared by the said testator to be his (or her) said last will and testament, in the presence of each of us, the undersigned, who thereupon, at his (or her) request, and in his (or her) presence, and in the presence of each other, have hereunto subscribed our names as the attesting witnesses thereof, the day and year last above written.

.....

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Many attorneys fail to insert the words above italicized. These words, however, are very important to be remembered in the case of a will made by a blind person, for the law does not ordinarily require that a will shall have been read to the testator in the presence of those who are to sign the document as witnesses. Yet, without the words above suggested, or words of similar import, the question of fraud may be raised.

[1] Dr. A. Maitland Ramsey, of Glasgow: "The design of the framers of the Act was, undoubtedly, to minimize the need for legal procedure; but their purpose in this respect has not been achieved, for no statute of recent times has been more provocative of litigation."—"*Eye Injuries: With Special Reference to the Workmen's Compensation Act, 1906,*" p. 4; reprint from *The Hospital,* Nov. 13, 20, 1909. This article, by the way, is a valuable contribution to the literature of "Visual economics."

general, but any child can be withheld from what has been called "the terrible torture of vaccination" if its parent, or any responsible person standing *in loco parentis,* avows before a magistrate that he disbelieves in the efficacy of the process. No machinery is provided for revaccination (*per contra* in Germany and especially in Italy).

England was the first of all the nations to provide for medical inspection in the public schools (1872); nevertheless in her system of inspection, even at the present day, there is much to be desired.

The medical inspection of school children is, in England, placed in the hands of the Sanitary Department of the local Government Board, the Board of Education having delegated the work to them. The "machinery" is said to be very defective. There are no requirements at all for admission, but the eyes of all children in "State" schools are tested after entrance. No arrangement has ever been made for treating or retesting.

Some special arrangements have been made for school children who see poorly, but nothing of an adequate nature. It is likely, however, that better arrangements will be made soon.

With respect to *ophthalmia neonatorum* we may say that the use of Credé-drops is not at all compulsory on the part of either medical man or midwife. In case the mother was delivered by a midwife, and any inflammation or discharge appears, the midwife is obliged to report the fact at once to "any qualified medical man," the choice of the particular man being left to her. In England, then, it seems, as in this country, a case of blindness from ophthalmia neonatorum is ever the fault of a midwife. It is somewhat singular that, in the course of my entire practice, which embraced a considerable number of cases of the absolutely unnecessary disease in question, there was not one single case which was not, indisputably, the fault of a regularly graduated physician.

Ophthalmo-sanitary laws in France.

In France, as in England, there exists an excellent Workmen's Compensation Act (that of Feb. 9, 1898), which has been amended and revised until as late as March 31, 1905.

As this law now stands, it provides for indemnity after industrial accidents (*accidents du travail*) no matter to whom the occurrence of such accident is due, excepting only when demonstrably the result from the inexcusable negligence of the injured person himself. This law applies to all industries operating in any way by means of machinery, excepting only such machinery as is run by man- or animal-

power. Further, the work of the injured employe must be interrupted for more than four days.

Twenty-four hundred francs is the maximum earning capacity which is used as a basis for full computation; all overplus is computed at one-fourth. For partial or temporary disability the workman receives one-half the reduction in his wages; for total and permanent disability, a pension equal to two-thirds the amount of his earnings. Pensions are revisable, after three years, the degree of disability being, of course, in many cases subject to change.

In case of the workman's death, 100 francs is paid as funeral expenses. Then, in addition, a pension of 20 per cent. of the wages of the deceased is allowed to the widow, and, to the orphans, 40 per cent. for the loss of one parent and 60 per cent. for both. Dependent relatives, if there be no surviving child or widow, may receive a pension equal to 30 per cent. the wages of the deceased.

Objection has often been made that the law in question has rendered difficult the securing of employment by married persons, especially if these have children. A further objection is sometimes offered that it provides no compensation for disfigurements which do not interfere with the earning capacity. In general, however, the law has been satisfactory (like similar laws in other lands) not merely to employes but also to employers.

In addition to the Workmen's Compensation Act—which has proved so beneficent in the way of preventing injuries of almost every kind—there exist in France numerous laws, or regulations, for the prevention of accidents and diseases. These provide for adequate heating, lighting and ventilation in factories, etc., for cleanliness, for proper water-closet facilities and protection from the action of numerous poisons (lead, methyl alcohol, etc.) and from steam, heated metals, electricity and various sorts of machinery. All these matters are under the control of the Ministry of Labor.

Vaccination is compulsory for all persons, civil and military, and revaccination for the military.

All contagious diseases must, in a manner of speaking, be reported. "Facultatively" reportable[1] are the conjunctivitis purulenta of adults and ophthalmia granulosa. Among the diseases for which are required both reporting and disinfection, is ophthalmia neonatorum.[2]

There is, in France, an excellent system of medical inspection in the public schools. The medical inspector does not, indeed, himself take charge of the treatment of the ailing children, but he is obliged to

[1] Decree of Feb. 10, 1903.
[2] Law of Feb. 15, 1902, art. 4.

report to parents the physical defects of such of their offspring as are attending the public schools; and the parents take the child to some physician of their choice. However, (and this is a point worthy of extensive imitation) the parents are obliged to see that the child is treated, and by some registered physician. The child cannot return to school without the permission (after careful examination) of the medical inspector.

There are no separate schools or classes for trachomatous pupils, the reason, as stated by an eminent French authority,[1] being that trachoma in France is not a sufficiently common disease to render such arrangements necessary. The rule is to permit to remain in the schools all trachomatous pupils exhibiting little or no conjunctival secretion, and to remove all those in whom these secretions are particularly abundant.

The prescription of glasses for school children is looked after, when necessary, and, in some cities, children who see poorly are grouped in special classes. Special schools for children with defective sight are not established, because, it is said, of the distance which children of this sort would then be obliged to go in order to get to school.

The hygiene of the lower schools is controlled by local boards, that of the high schools by the Ministry of Public Instruction.

Midwives are obliged to report at once any discharge or inflammation from the eyes of an infant. The report is made, in Paris and Lyons, to the prefecture of police; elsewhere, to the "maire." The use of Credé-drops is compulosry in all cases, irrespective of discharge or inflammation.

Finally, *"le livret à famille"* hands to all newly married couples a printed card, or circular, containing instructions with regard to the above-mentioned and various other matters.

Ophthalmo-sanitary legislation in Germany.

In Germany, as one might readily suppose, the subject of ophthalmo-sanitary legislation has, in common with sanitary legislation of a general character, received a good deal of attention. It would be impossible to elucidate completely here even the more salient matters of this kind of legal enactments in Germany, but a few of the more peculiar (and, at the same time, I think, sensible and scientific) features may simply be pointed out, practically unaccompanied by comment.

The Prussian sanitary corps is organized as follows: Each county

[1] Chevallereau, in *Encylopédie français d'ophtalmologie.* Paris, 1910, Vol. IX, p. 545.

(Kreis) has its Kreisarzt,[1] or official physician, for the county. Next each province has its *"Provinzial-Medizinal-Collegium,"* or Provincial Medical College. Over this is the *"Wissenschaftliche Deputation,"* the highest consulting body of the corps. This last-named body, however, is a branch of the *"Abteilung für die Medizinalangelegenheiten"*—itself a branch of the ministry *"der geistlichen Unterrichts-und Medicinal-Angelegenheiten."* In addition to all these there exists in certain cities *"Gerichtsärzte,"* or "Physicians before the Courts," who are often called upon as experts by the State's Attorney.

Taken altogether, the medical corps is, in Prussia, a many-ranked hierarchy. Its work, however, I understand, is very thoroughly carried out.

Vaccination, to begin with one of the most important matters, is absolutely compulsory in the first year of life, and re-vaccination in the twelfth.

Trachoma, diphtheria, small-pox (the little there is to be found of this last-mentioned disease) must be reported to the police on official cards throughout Germany. There is also a Prussian law[2] which, during epidemics, renders obligatory the treatment of certain diseases, among which trachoma is here especially noteworthy.

The use of Crédé-drops is nowhere compulsory, but a peculiar feature of the law relating to *ophthalmia neonatorum* (characteristically German, too, though a similar practice now prevails in France) is that in many of the cities, notably Berlin, printed instructions concerning the matters in question are handed over to newly married couples.[3] In some of the cities the printed card is not handed over until the first birth is reported—when, of course, it could do no good in the way of prophylaxis, unless indeed as to the eyes of later-born children.

The medical inspection of the public schools is very different in different localities. All the larger and many of the smaller towns employ "school-doctors" not only for the public, but also for some of the private schools—gymnasiums, etc. In Berlin there are 56 school-doctors, each controlling about 5,000 children.[4] All children are tested when they enter, and at intervals, later. Whenever the

[1] The classic work on the functions of the Kreisarzt is Schlockow, *"Der Kreisarzt."* In general, these functions are to supervise all public sanitary institutions, asylums, etc., also the registers of physicians, pharmacists, midwives, etc. Their court-work is restricted to certain police-evidence.

[2] That of Aug. 28, 1905.

[3] One can hardly conceive of such highly sensible, albeit blush-producing, measures being adopted in the land of the free and home of the brave and often unnecessarily blind.

[4] I am credibly informed that each of these "school-doctors" in Berlin is paid, for looking after his 5,000 youngsters, only 2,000M. annually—less than 500 dollars!

necessity exists, the children are sent to public or private dispensaries. When the parents are poor, the children's glasses are paid for by the city.

Children with defective vision are put into extra classes—the so-called *"Nebenklassen."* The results of this arrangement are exceedingly satisfactory. However, the vision must be less than 1/10, which is a slight drawback. Other children are, as with us, turned over to the blind-schools. The treatment of the children is compulsory on the parents. A doctor treating a case of trachoma must, as above-mentioned with regard to trachoma in general, report the case to the police on an official card.[1] The police re-report the matter to the Kreisarzt, and this latter functionary sees that the patient takes his treatment and that the doctor's various instructions are actually carried out.

Indirectly tending toward the prevention of injuries to, and diseases of, the eye, is the excellent *Unfallversicherungsgesetz,* which, as already mentioned, has been so widely copied in the legislation of other lands. It would be impossible here, owing to limits of space, even to sketch in outline this very thorough and far-reaching law; we may, however, direct attention to a few, only, of the most characteristic features.

The law provides, then, in effect, for the insurance of all, or nearly all, workmen by their employers. The system consists of two divisions —the federal, and the state. The federal division is organized as a department of the Bureau of the Interior. The state divisions are organized as bureaus of insurance in each of the Bundesstaaten. The state bureaus control the industries within the state, and the federal bureau those of a national, or interstate, character. Every bureau—the federal bureau, as well as the different state bureaus—"collects statistics, makes rules, and constructs reports, and serves as a court of final appeal." Subordinate to the various bureaus are the "Courts for Industrial Claims," the personnel of which consists of one government official (President) and two representatives each, from the employers and the workmen. These courts appoint medical examiners who make reports and who also testify before the court, if there be necessity therefor. The parties themselves may choose the expert, if they so desire. There is no jury.

The fund from which the claims are paid is held by trustees, and is composed chiefly of assessments paid into the fund at stated intervals by the various employers of the nation, grouped into definite units.

[1] Teutonically thorough is the requirement that complications, origin, nativity, and many other matters must be stated on the card.

The various awards, pensions, expenses, etc., are paid through the Post-Office Savings Bank, and there is no such thing as a judgment being worthless by reason of insolvency on the part of any individual employer.

There also exists, by virtue of this same law, insurance against sickness, old age, invalidism and the first thirteen weeks of disability resulting from accident. The benefits, however, of this "Sickness Insurance Fund" are available only to manual laborers earning not to exceed 2,000 marks yearly.

In addition to this Workmen's Compensation Law—which has had the effect of causing employers to take the utmost possible precautions against accidents—there exist the regulations of the various unions (Berufsgenossenschaften), which regulations are nailed upon the walls of factories, mines, etc. Infraction of these rules is fined heavily—as high indeed as to 1,000 marks.

Ophthalmo-sanitary legislation in Italy.

In Italy the legislation for the prevention of ophthalmic, and other, injuries or diseases, is not so thoroughgoing, quite, as it is in Germany. Yet, in many respects, it is better than similar legislation in the United States.

The sanitary organization is very good indeed—complete and yet not cumbersome. The actual supervision of the public health is delegated to Communal Physicians (Official Sanitarians) while, over these, are the Physicians of the Province, who, in turn, are subordinate to the General Bureau of Health, which forms a part of the Ministry of the Interior. There exist also Provincial Sanitary Councils and a Superior Council of Health.

Vaccination is obligatory for all children in the first six months of life. It must be repeated whenever the sanitary authority deems a repetition necessary. Admission to schools, factories, and various classes of institutions is absolutely barred, except to persons who have been properly vaccinated.[1]

All persons taking up their domicile in the Commune of Milan (and the same regulation exists in certain other communes) must submit at once to vaccination unless indeed he has been successfully vaccinated within six years.

Among other diseases which have to be reported are the following, important from an ophthalmic viewpoint: Trachoma, diphtheria,

[1] Regolamento sulla vaccinazione 29 marzo 1892 ed art. 130 della legge sanitoria 1 agosto 1907.

small-pox, typhoid fever, and syphilis when that disease has been communicated by "mercenary intercourse." There are no formal official cards, however, providing for a large amount of detailed information, such as are used in Germany. The sanitarian is simply required to report "the necessary indications." Trachoma, furthermore, does not have to be reported. It is only fair to add, though, that the sanitary authority can, when he believes it to be necessary, render the reporting of this disease obligatory. And that has now and then been done, when a severe and wide-spread epidemic of trachoma had appeared.

In the regulations concerning rosiculture, trachoma is regarded as a reportable disease.[1] The patient is always isolated. In this kind of cultivation, I am informed, there is a great foregathering of workmen from very many places.

Midwives are not obliged by law to report "any redness or inflammation of the eyes," but, as a rule, they do actually report these matters (in accordance with certain instructions issued to all who practise midwifery) to physicians, and then the physicians are obliged to make a report of the case. Midwives are also instructed to wash the lids and inward parts of the eyes of all newly-born children with boric acid lotion, and then, if, in spite of these precautions, an inflammation develops, to report the matter, as above stated, to some qualified physician.

No printed cards relative to ophthalmia neonatorum are handed over to newly-married couples, as is done in France and Germany.

No certificates relative to the sight are required for admission to the schools. All the communes, however, have their schools inspected medically at least once per month, thus, in the matter of frequency, setting a splendid example to nearly all civilized lands. If contagious diseases are discovered, all the afflicted pupils are removed until such time as the reappearance of such pupils can be made in the schools with perfect safety to other students. The matter is chiefly left to local supervision, but the governmental sanitary authority also has the power to carry out the inspection himself.

In some of the communes oculists, as well as general practitioners, are employed to inspect. In general, however, the law pays little attention to matters of sight, but lays most stress on the subject of contagion. Very much is left, in every jurisdiction, to the discretion of the teacher and the visiting physician.

There are no separate classes for children with defective sight. Sep-

[1] Art. 13 del Reg. 29 marzo 1908.

arate schools (or classes) however, exist in the larger communes for children afflicted with trachoma.

The excellent German *Unfallversicherung,* already adverted to in this article a number of times, has stood as a model for similar legislation in Italy, as in so many other countries. This insurance law has special application in Italy to industries in which machinery is used, and in which the number of workmen employed exceeds five. Crews of ships are also insured. Agricultural laborers are not insured, excepting those occupied in the use of machinery. The law, I understand, "works well and is severely applied." It has also "prevented hosts of accidents."

In addition to this very beneficent compulsory insurance law, there exist in Italy numerous regulations for the prevention of mischances in various sorts of industries. A discussion of these would lead us far afield. Suffice it to say that, in Italy, almost every form of injury by machinery, explosive substances, poisons, etc., etc., has been brought within the prevision of the law.

IV.

MALPRACTICE.

Surgery means snags, and he that does much surgery will sooner or later discover himself entangled in snags of a legal kind. To this rule the surgery of the eye is by no means an exception; it is, in fact, rather an exaggerated instance of the working of that rule. The largest proportion of malpractice suits, to be sure, grows out of fractures and dislocations,[1] while obstetrics as a fruitful field for damage suits comes clearly next in order, but then, as class three, and close to the two preceding categories, comes the surgery of the eye.

The reasons for this high degree of liability in the case of ophthalmic surgery are exceedingly numerous. Suffice it to state three: (a) The delicacy and great importance of the organ on which such surgery is done. (b) The rather large amount of surgery which is necessary in connection with the treatment of diseases of the eye. (c) The special responsibility imposed by the law (at least in the United States and England) upon any one who professes to be a specialist.

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[1] This, at least, is true in the United States. In Germany, I understand, malpractice suits arise most often from obstetrical procedures. See, for example, Gottschalk, "*Gerichtliche Medicin,*" p. 271: "Von den Anklagen wegen Kunstfehler nehmen aber an Zahl die erste Stelle ein diejenigen gegen Geburtshelfer." The statement accords with the generally received opinion that deformity of the female pelvis is commoner by far in Germany than in the United States.

OPHTHALMIC JURISPRUDENCE

In the discussion of the subject of ophthalmo-surgical malpractice, precedence will be given—as was done in the case of the ophthalmic expert witness—to

A.—Legal considerations regarding malpractice.

Legal considerations regarding malpractice in the United States. In the United States—as indeed in almost, but not quite, every civilized country—this one basic proposition underlies the entire law of malpractice, namely, that a physician is never legally required to respond to a call for professional assistance, if (a) he is not a governmental officer and thereby under official obligations, or if (b) he has not already established relations with the case. This is precisely to the contrary of the popular impression, but is nevertheless the law. Says Wharton:[1] "No question can exist as to the legal right of a physician, unless he be an officer of the government charged with specific duties, which he thereby violates, to decline to take charge of a particular case." A recent Indiana case[2] well illustrates precisely how free a physician is to refuse to take charge of a case. Here the physician, who had been the patient's family practitioner, refused, admittedly without reason, to respond to the call of a man who was intensely sick, although he (the doctor) had confessedly been tendered the fees for his services in advance, and although he knew that no other physician could possibly be procured in time to be of service to the patient, and that, if he (the physician in question) did not respond, the patient would probably die in consequence. The sick man did actually die, and, as alleged, in consequence of the physician's non-response to his call. There could hardly have been a stronger case against the physician, were the law other than it really is. But said the court: "The act is a preventative, not a compulsive, measure. In obtaining the state's license (permission) to practice medicine, the state does not require, and the licensee does not engage, that he will practice at all or on other terms than he may choose to accept. Counsel's analogies, drawn from the obligations to the public on the part of innkeepers, common carriers, and the like, are beside the mark."

When, however, a physician once takes charge of a case, certain responsibilities attach to his work immediately and by implication. No express agreement to be responsible for this or that is at all necessary in order to render him responsible. On the other hand, with one exception, he cannot evade his professional liabilities by any sort of

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[1] *On Negligence*, Sec. 731.
[2] Hurley Admr. *vs.* Eddingfield, 156 Ind., 416.

contract whatever, however express and however explicit. Contracts made in advance of treatment or operation, with a patient, or with a patient's parent or guardian, that the physician is not to be sued for malpractice, are universally held to be "opposed to public policy" and therefore void.[1] The one exception is where a physician declares to the patient his inability to treat the case properly (as, for instance, in many instances, where a specialist is recommended) and yet the patient insists that the physician proceed to do the best he can. In such circumstances the patient is estopped from complaining afterward that the case has not been treated properly—provided, of course, the physician has really done the best he could.

On the other hand, although, as we have seen, the physician cannot, generally speaking, diminish, either in number or extent, the liabilities which the law imposes on him, he can very easily (and often to his sorrow) very greatly enlarge them. And he can also lessen his rights, as well as increase his liabilities. A very common instance of lessening his rights results from the "no cure no pay" agreement. In this instance, if the patient is not cured he does not have to pay; the physician has lost his right of action against him for the fees. An instance where the physician voluntarily enlarges his liabilities results from the "guaranty to cure." This highly important arrangement is a very different affair from the "no cure no pay" agreement, though, as a rule, physicians confound the two together. When a physician guarantees to cure, he must cure, or "pay the difference." That is a very different consequence, as will at once be noted, from merely losing one's fees. To illustrate: If a physician operates for cataract, and guarantees to restore to the operated eye its vision, then, if the sight be not restored, the measure of the damages is precisely what the sight of that eye would have been worth. A jury may assess this value at thousands of dollars.[2]

Now, what are these responsibilities that attach to a physician immediately upon his acceptance of a case, and by implication irrespective of any express contract? They are:

1. Properly to continue his attendance.
2. To possess a reasonable degree of learning and skill.

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[1] Nor does treating a case gratuitously at all diminish the physician's liability for malpractice.

[2] It is a general rule of contract that, when a party has, for a consideration, agreed to deliver a certain article—whether iron rails or eye-sight—and has failed to deliver it, he must pay to the injured party the value of the article in its stead. Returning the compensation may, in the case of some contracts, be precisely equivalent to payment of the value of the article, but (as in the case of failure to restore to a cataractous eye its sight) it may fall short of so doing by several thousand dollars.

3. To use that reasonable degree of learning and skill.

4. In cases of doubt, to use his best judgment.

Of each of these duties, we will treat in the order indicated, and, later, of certain miscellaneous affairs of importance in connection with malpractice.

1. As to the physician's duty properly to continue attendance, we may say, briefly, that, in no instance, may he discontinue his treatment, unless (a) the patient discharges him, (b) the patient consents to the discontinuance, (c) the physician gives timely notice so that the patient may employ another doctor in due season, (d) when the patient is no longer in need of the physician's services.

2. The physician's second duty, when he has once taken charge of a case, is to possess a reasonable degree of learning and skill. Of course a physician is not responsible merely for failure to cure. He is responsible only for the failure to possess (or to use) a reasonable degree of learning and skill. The question unavoidably arises, What constitutes a reasonable degree of skill and learning? In the United States, there exist on this important head three very different rules:

a. The physician is bound to exercise that degree of care and skill which prevails in *the particular locality* in which the given case arises.[1] This rule is not much followed.

b. The physician is bound to exercise that degree of care and skill possessed by physicians in *such localities generally*.[2] In this case, the court said, speaking with regard to the first of the rules on this subject, namely, the "particular locality" rule: "There might be but few practising in the particular locality, all of whom might be quacks, ignorant pretenders to knowledge not possessed by them, and it would not do to say, that, because one possessed and exercised as much skill as the others, he could not be chargeable with the want of reasonable skill." According to this second, or "similar localities" rule, the physician practising in a large city is bound to possess a higher degree of skill and knowledge than physicians who practise in the smaller cities and those in the smaller cities than those who practise in the villages and the country. The second rule is the prevalent rule, by far.

A most excellent, as well as recent, case upon this second, or general, rule, is that of Shelton *v.* Hacelip (51 So. Rep. 937, May 7, 1910, Ala.). In this case, a child, 11 months of age, Velma Hacelip, "had been affected with chicken-pox and nausea, and the right eye (the one destroyed) was inflamed, ulcerated in the external corner, had scabs

[1] Hathorn v. Richmond, 48 Vt. 557.

[2] Gramm v. Boener, 56 Ind. 497. McDonald v. Harris, 131 Ala. 359.

on it, and was infected with pus and 'septic poison.'" The further facts (all undisputed) were: "That defendant was called professionally to see her, mainly, it appears, for the eruption and nausea. That he examined the right eye, and stated that he would give a prescription for its treatment, and at the same time instructed the parents to keep the organ clean with the frequent application of warm boiled water. That what was received as this prescription was used by dropping three or four drops, from a teaspoon, into the eye after lifting the eyelid. That this application was made in the afternoon about two o'clock. That the child at once gave evidence of being in great pain in that eye, and, with its hands, rubbed off the scabs, and introduced the poisoning pus into the eye. That the sight of the eye was destroyed when examined on the succeeding morning, the destruction being accomplished by the thickening of the tissues over the sight of the eye."

The court first quoted the rule as given in McDonald v. Harris (131 *Ala.* 359) as follows: "The reasonable and ordinary care, skill, and diligence which the law requires of physicians and surgeons is such as physicians and surgeons in the same general neighborhood, in the same general line of practice, ordinarily have and exercise in a like case." The opinion of the court was then as follows: "The evident theory of the plaintiff (appellee) was on the trial that the liquid introduced into the eye contained carbolic acid, and that the destruction of the sight resulted from that. It is obvious that, if the loss of sight was due to disease, the defendant did not breach his duty, unless in the treatment thereof he failed to measure up to the standard stated before; and it is equally as obvious that the plaintiff's theory excludes any other means or omission leading to that breach of duty in the premises except that rested on the use of carbolic acid (a matter disputed in the proof) in the prescription written by the defendant in the treatment of the eye. Dr. Hughes and defendant both testified that the prescription written by defendant was prepared by Hughes, and not by defendant, and that in it there was no ingredient of carbolic acid. Dr. Murray testified that the eye nor lid nor face gave any evidence of having been burned with carbolic acid, and that in his opinion the loss of sight was due to the disease. There are some tendencies in the evidence to the effect that the preparation contained carbolic acid, the chief of which were afforded by the testimony of two witnesses that the contents of the bottle bore an odor of carbolic acid, and that the sediment in the bottom of the bottle was similar to that made by an excess over a solution of carbolic acid.

"The burden of proof in cases of this character is on the plaintiff to

show that the defendant's care, skill, or diligence in the given case was not that required, as stated, of physicians and surgeons; and it should be added that there is no presumption of negligence or want of skill arising from the failure to cure. (30 *Cyc.* p. 1584, and authorities in notes.) It is evident from this record that the controlling issue was whether the preparation applied to the eye was that prescribed by the defendant. As indicated, there was some evidence tending to show that the preparation was that prescribed by the defendant, and that it contained carbolic acid. It consisted of the testimony of Mrs. Daniel that the defendant brought the bottle to the house where the child was, and that out of this bottle the liquid was put into the eye. It must be conceded that there was a conflict in respect of the issue stated. In the light of all of the evidence, however, the opinion is entertained that the weight of the evidence and the probabilities of the truth of that tending to fix liability upon the defendant are so strongly against the verdict as to carry conviction that it is wrong and unjust.

"In the first place, the long period of time elapsing between the injury and the institution of the action, in connection with the undisputed fact that defendant was subsequently often called professionally to treat members of Mrs. Daniel's family, are circumstances impossible to be ignored in determining the weight to be given Mrs. Daniel's, the next friend's, testimony. In the second place, Dr. Sullivan's testimony may be taken at the limit of its probative value, and yet, when boiled down, it amounts to nothing more than that the injury "might"—a term, as employed, no stronger than possibly—have been produced by carbolic acid, or "might" (i. e., possibly) have resulted from a virulent form of conjunctivitis, a disease of the membrane of the eyeball. There was for the plaintiff no evidence that the eyeball or its membranes were burned by a caustic; carbolic acid being of that class of chemicals. On the contrary, the proof is conclusive that carbolic acid, when applied to the human anatomy—its component membranes—deadens, and the inevitable effect is to produce a sloughing of the cauterized part. There is a total absence of proof that any sloughing occurred. As we view the evidence here, it is impossible to cauterize a membrane with carbolic acid, and affect only to change its color. It is incredible on this evidence that the iris could be altered in color from brown to white by the application of carbolic acid, and at the same time avoid sloughing of the cauterized membrane. Directly opposed to the plaintiff's theory of fact there is the testimony of Hughes and defendant and that of Dr. Murray, and the original prescription defendant contends was supplied by him. The

two first mentioned say that there was no carbolic acid in the preparation, and that the prescription was filled by Hughes, and not by the defendant. The original prescription is before us. Carbolic acid is not one of its named elements. Dr. Murray saw the eye the next day, and he is positive that there was no evidence of cauterization about the eye or face. So far as appears, he is without interest in the premises. He was called by Mrs. Daniel. Support for the plaintiff's insistence must come from the odor and the sediment. Two witnesses say there was an odor of carbolic acid, and one that there was a cloudy sediment in the bottle. The inevitable effect of carbolic acid on membranes and the positive statement of Dr. Murray that there was no cauterization, and that there was no sloughing and the testimony of Hughes and defendant, all in connection with the long lapse of time between the injury and the commencement of the action and the continuance of defendant in the professional service of the household, compel the conclusion that carbolic acid did not destroy the child's sight.

"The court should have granted the new trial. Its refusal was error, and on that account the judgment must be reversed."

c. Some of the lower courts have attempted to establish a yet higher standard of professional knowledge and skill, a standard which has been expressed in the following language: "Such skill and diligence as are ordinarily exercised by *thoroughly educated physicians and surgeons.*" No court of last resort, however, in the United States, has yet sustained this rule.[1] However, the tendency is, with the continued improvement in medical education, for the courts to approximate more and more closely to this very high standard of medical and surgical requirements.

Now, all these three rules (the second, as before stated, being the prevailing one) apply to general practitioners only. A question of especial interest of course arises here: What is the standard of requirement in the case of specialists, ophthalmic surgeons, for instance?

It is undoubtedly a fact that a specialist (and, in this connection, a specialist is any one who holds himself out, in effect, to be such) is bound to a higher degree of skill than is a general practitioner. The rule is that a person assuming to be a specialist must really possess and actually use the ordinary learning and skill possessed and used

[1] Unless we except the Supreme Court of Pennsylvania in McCandless v. McWha (22 *Pa. St.* 26). In this case Woodward, J., defined "reasonable skill and diligence" to be "such as thoroughly educated surgeons ordinarily employ." It is a question, however, whether this definition is not merely *obiter*. Further, the case is by no means recent; its date is 1853.

by others who practise the same specialty or specialties in similar localities. Even in the case of a specialist, however, practising in a city of the very largest class, the degree of skill required is by no means such as would enable him to effect a cure in every case that comes before him. There is, in other words, on the part of the specialist no implied warranty to cure any more than there is in the case of the general practitioner. A warranty to cure can arise only from an express contract—a contract which, however, as everybody knows, even with all its possible disastrous legal consequences, certain physicians are nevertheless unwise enough to enter into. The law does not attach legal consequences, either to general practitioner or to specialist, merely for failure to cure. It is to malpractice—the failure either to possess, or to use, the proper degree of knowledge and skill (which varies according to locality, specialism, etc.) that the law attaches such consequences. The leg or the arm, or the ear or the eye, must have been improperly treated or in some way neglected, in order to constitute malpractice.[1]

The effect of this principle is very far reaching. In Stern v. Lanng,[2] for instance, Dr. Lanng, an oculist, had removed a chalazion from the left lower eyelid. He had made on the conjunctival surface of the lid a crucial incision down into the cyst, and, after removing the gelatinous contents of the growth, had used a tiny scoop for the removal of the sac. Finally, he had cauterized the cavity by means of a stick of nitrate of silver "about an inch in length" and "about the shape of a lead pencil." The eye itself became much inflamed, and solutions of atropin and boric acid were employed to combat the inflammation and for disinfecting. The lid became adherent to the cornea, and the cornea became opaque. In consequence of the corneal opacity the eye was entirely blind. At the trial three expert oculists pronounced the treatment proper. Said the judge in the higher court: "The inflammation of the cornea, and consequent opaqueness, is ascribed by the appellant to the cauterization of which he complains, but this is not sustained by the testimony. There are, we are informed, a number of causes for it, and that it is impossible to look at the eye and tell whether it has been burnt or not . . . The result of the treatment is not all that is necessary to recover. It must be made evident that there was negligence or want of skill. There was intense pain felt by plaintiff after the incision. It does not necessarily

[1] And, need we add, damage of some sort must actually have followed from such unskilfulness or negligence, in order to entitle the patient to recover. Otherwise, it is *injuria absque damno*, wrong without damage, and this is not actionable.

[2] 106 *La.* 736.

follow, as we infer, that it was owing to the negligence or unskillfulness of the physician." The judgment which the defendant had obtained below was therefore affirmed.

Another leading eye case on this point is that of Pettigrew v. Lewis et al.[1] The plaintiff, a school teacher, alleged that an operation had been performed on her left eye by the defendants (partners) for strabismus, and that the operation had been performed so negligently and unskillfully "that her eye became sore and weak, rendering her unable to complete her education or to perform ordinary household work." She further alleged that she "suffered and still suffers great physical pain in consequence of the unskillful operation and treatment, which has continued to increase since the time of the operation." The lower court, however, sustained a demurrer to the evidence, "holding that it was insufficient to establish a liability against the defendants . . . and gave judgment accordingly." The plaintiff took the case to the Supreme Court, there urging "that the testimony offered by her was sufficient to take the cause to the jury." But said Justice Johnston: "We agree with the district court that it [the evidence] did not show the operation to have been unskillfully and negligently performed, nor yet that the present condition of her eyes was the result of the operation that was performed. No proof was offered of the instruments used or the manner in which the operation was performed. No medical or scientific evidence was offered showing the cause of the present condition of the plaintiff's eyes, nor that the defendants were negligent or careless in the performance of the operation. In fact no witnesses having special skill or knowledge with reference to the treatment of the eyes were introduced in behalf of the plaintiff. The burden rested on the plaintiff to show a want of due care, skill, and diligence in the operation, and that the defective condition now existing is the result of such want of care, skill, and diligence."

Now the degree of learning and skill which the specialist does really need to possess and actually to employ in order to escape the legal consequences which the law imposes upon a specialist guilty of malpractice, is, as already stated, such a degree as is ordinarily possessed and actually used by specialists (not general practitioners) practising the same specialty, or specialties, in similar localities.

A couple of illustrations may possibly here be useful. In Feeny v. Spalding[2] the defendant was a distinguished oculist who practised in Portland, Me. While on a trip to Machias he stopped over for a short

[1] 48 *Kan.* 78.

[2] 89 *Me.* 111. See also Rann v. Twitchell, *Vt.*, 1909; 71 At. 1045; 20 L. R. A. N. S. 1030.

time at Cherryfield. Here a girl, seven years of age, cross-eyed since she was a year and a half old, was brought to him for examination and treatment. After a conference with the parents, defendant performed a surgical operation on one of the plaintiff's eyes. The plaintiff alleged that, prior to the operation, the sight of the eye on which the operation had been preformed, was at least fairly good, but that, after the operation, it was entirely wanting. She further alleged that this result was produced by defendant's ignorance, want of skill, and carelessness in the performance of the operation. The plaintiff, in the trial court, had received a verdict. Said the court: "It was encumbent on her [the plaintiff] to prove that the injury complained of was caused either by the defendant's want of that degree of skill and knowledge which is ordinarily possessed by physicians who devote special attention and study to the treatment of the eye, or by his failure to exercise his best judgment in the application of his skill to the particular case, or by his failure to use ordinary care in the performance of the operation, and in giving such instructions as should have been given by a surgeon who was only to perform the operation, and who was temporarily in the locality where the patient lived . . . At the trial, the plaintiff relied almost entirely upon the result which it is claimed followed the operation . . . while the expert testimony on the part of the defense was to the effect that an examination of the eye showed conclusively that the defective vision had existed from birth and that it was as good at the time of the trial as it ever had been . . . Even if there was sufficient evidence to authorize the jury to find for the plaintiff upon this question, such a finding was not sufficient to warrant a verdict for the plaintiff, when there was no evidence of any want of the requisite skill, knowledge, or care upon the part of the defendant."

Still another case is that of Baker v. Hancock.[1] Here the defendant was a specialist in the treatment of cancer. Plaintiff alleged that defendant had placed upon his nose a substance by "which the end of his nose was eaten off." The verdict below was for the defendant, but the higher court reversed the judgment and remanded the case for a new trial, saying: "Scientific investigation and research have been extended and prosecuted so persistently and learnedly that the person affected by many forms of disease is of necessity compelled to seek the aid of a specialist, in order to secure the results thereof. The local doctor, in many instances, himself suggests and selects the specialist whose learning and industry have given him a knowledge in

[1] 29 *Ind. App.* 456.

the particular line which the general practitioner, in rural communities especially, has neither time nor opportunity to acquire. (Small v. Howard, 128 Mass. 131.) Being employed because of his peculiar learning and skill in the specialty practised by him, it follows that his duty to the patient cannot be measured by the average skill of general practitioners. If he possessed no greater skill in the line of his specialty than the average physician, there would be no reason for his employment; possessing such additional skill, it becomes his duty to give his patient the benefit of it. The appellee, if he held himself out as a specialist in the treatment of cancer, was bound to bring to the discharge of his duty to patients employing him as such specialist that degree of skill and knowledge which is ordinarily possessed by physicians who devote special attention and study to the disease, its diagnosis and treatment, having regard to the present state of scientific knowledge. This is the degree of skill which, by holding himself out as a specialist, he represented himself to have; and it does not lie with him to assert, after securing employment and compensation on that basis, that his representation was not true."

In any case, however, whether the defendant is city or country general practitioner or city or country specialist, the degree of skill and learning required has reference always to "the present state of medical and surgical knowledge." This legal proposition is illustrated clearly in Peck v. Hutchinson.[1] The plaintiff, as alleged, had had "infection of conjunctivitis and blennorrhea," together with a perforating ulcer of the cornea and prolapse of the iris. Defendant had operated on the eye, and, as alleged, had used "too large a knife," etc., etc. A matter which bulked very largely at the trial was that, in the course of the operation, the plaintiff had suddenly jerked her head about, causing the production of a false incision, deep and long, directly across the cornea. To this unfortunate movement the defendant attributed the non-success of his operation. The plaintiff, in her turn, contended that the movement was unavoidable by reason of the fact that the work had been done under local, instead of general, anesthesia. The plaintiff's counsel was allowed to read from Wells's "*Treatise on the Eye*" the remarks by that author on the subject of iridectomy. In the course of these remarks the author states that, for iridectomy, chloroform should always be administered. He does not even men-

[1] 88 Iowa 320, 55 N. W. Rep. 511 ("N. W. Rep." stands for "*Northwestern Reporter,*" a convenient periodical, published by a private company, but containing in each issue the latest decisions of the courts of last resort in various northwestern states. It appears sooner, and is often more accessible later, than the official state reports. There is also a "*Southwestern Reporter,*" a "*Southeastern Reporter,*" etc.).

tion local anesthesia. In accordance with the views of this book, the counsel for the plaintiff declared that the defendant had neglected his duty, inasmuch as he had operated with local anesthesia only. But said the higher court: "The book was published in 1880 . . . the operation was performed in 1886, and it is claimed that, after 1880, and prior to 1886, great changes had occurred in optical surgery; that during that time, cocain, a local anesthetic, was discovered, and came into use, thus superseding the use of general anesthetics in such cases. This may be conceded . . . that fact was fully shown to the jury. 'Physicians and surgeons are required to use ordinary skill and diligence . . . having regard to the improvements and advanced state of the profession at the time of the treatment.'" The judgment, which, in the lower court, had been for the plaintiff, was, therefore, by the higher court reversed.

Here is a still further point in connection with the question of what constitutes a reasonable degree of learning and skill. The matter is always to be tested by the doctrines of one's own school of practice. This legal proposition is absolutely indisputable, having been decided in a very large number of cases, with, so far as I know, not a single dissenting case.[1] The principle is, in fact, not merely good law, but also good sense. So long as the law gives recognition to various so-called "schools," it must, as a natural consequence, allow the treatment of any given physician to be tested by the doctrines of the school he professes to practice. To hold a regular practitioner culpable for ignoring the principles of, say, homeopathy or of eclecticism, or an osteopathic physician for not proceeding according to the principles of regular medicine or of homeopathy, would be, in effect, not merely to violate the compact made with the State when the physician was granted a license to practise, but also to break the contract made by implication between the patient and the practitioner when the latter was employed in the case.

The rule, however, does not apply to the case of a clairvoyant or of any other person who practises a system which has no recognition under the law and nothing definite in the way of rules and principles. Thus, in Nelson v. Harrington,[2] said Lyon, J.: "To constitute a school of medicine under this rule, it must have rules and principles of practice for the guidance of all its members, as respects principles, diagnosis, and remedies, which each member is supposed to observe in any given case. Thus, any competent practitioner of any given

[1] This rule, however, has never been adopted, at least so far as I have been able to ascertain, in any of the countries of Continental Europe. As to American cases, see Bowman v. Woods (1 *G. Greene*, 441); Force v. Gregory (63 *Conn.*, 167); Spead v. Tomlinson (73 *N. H.* 46); Grainger v. Still (187 *Mo.* 197); Shockley v. Tucker (127 *Iowa* 456).

[2] 72 *Wis.* 591. Cited also *supra*, under another legal proposition.

school would treat a given case substantially the same as any other competent practitioner of the same school would treat it. One school may believe in the potency of drugs and blood-letting, and another may believe in the principle *similia similibus curantur;* still others may believe in the potency of water, or of roots and herbs; yet each school has its own peculiar principles and rules for the government of its practitioners in the treatment of diseases. Not so, however, with the clairvoyant practice. True, the practice has but one mode of ascertaining what the disease is, and the remedy therefor. This mode has already been stated. But the mode in which a physician acquires a knowledge of his profession has nothing to do with his school or system of practice. One person may acquire such knowledge from certain books; another from certain other books, which perhaps teach different principles; still another from oral communication, as lectures, et cet., or from experience alone; and still another from his intuition when in an abnormal mental state; yet these differences do not necessarily constitute separate schools of medicine."

This was "a case of first impression," (as mentioned by the learned justice himself in his opinion) but it is now the settled law.

3. Now it is, furthermore, absolutely necessary that a doctor, whether his field of work be limited or unlimited, and whether his practice be chiefly in the city, or in a town, or in the smallest country village, not merely possess, but that he also actually make use of the skill and learning which the law requires him to possess in accordance with the rules above stated. He must not be negligent, however skillful he may be. He must actually exercise his skill. Otherwise he is guilty of malpractice.

It is not essential that this division of the general subject be greatly amplified, but here it is certainly important to lay some stress on a matter which should prove of interest to oculists, who, as a rule, do rather a great deal of innovating. I refer to the matter of experimentation. On this head, the general principle is quite clear: Thou shalt not experiment on mankind. The use of new and untried remedies or new and untried operative procedures, are alike forbidden, in the case of man. The view of the law is that experimentation should be conducted on the lower animals. Just what would happen to medical progress in case our friends, the antivivisectionists, should carry their point, and experimentation on animals should be forbidden also, as well as that on man, is a trifle unpleasant to think about. Possibly, in the words of Micawber, we should "progress in a retrograde direction." However, the matter is not so bad as it looks in the light of the general rule. There is one exception: The doctor may in-

novate in the case of an unusual disease (pellagra, for example) or of new and unusual combinations of symptoms in old diseases. Even in such cases, however, he must be altogether able and ready to prove that his innovations were not haphazard, but that they were based on things already known and that they were carried out in accordance with a definite and sensible theory of some benefit to accrue to the subject of the experiment himself.[1] Said the court, in Jackson v. Burnham:[2] "There must be some criterion by which to test the proper mode of treatment in a given case; and, when a particular mode of treatment is upheld by a consensus of opinion among the members of the profession, it should be followed *by the ordinary practitioner;*[3] and if a physician sees fit to experiment with some other mode, he should do so at his peril. In other words, he must be able, in the case of deleterious results, to satisfy the jury that he had reason for the faith that was in him, and justify his experiment by some reasonable theory." Again, in Carpenter v. Blake,[4] said the court: "Some standard by which to determine the propriety of treatment must be adopted; otherwise experiment will take the place of skill, and the reckless experimentalist, the place of the educated, experienced practitioner. If the case is a new one, the plaintiff must trust to the skill and experience of the surgeon he calls; so must he if the injury or the disease is attended with injury to other parts, or other diseases have developed themselves, for which there is no established mode of treatment. But when the case is one as to which a system of treatment has been followed for a long time, there should be no departure from it, unless the surgeon who does it is prepared to take the risk of establishing, by his success, the propriety and safety of his experiment."

Of course the great defect of the law with regard to the matter of experimentation and innovation (medically speaking—we admit that the subject is difficult) lies in this one point, namely: That it makes no kind of provision whatever for the finding out of new and more perfect methods of treatment in old and well-known diseases presenting old and well-known combinations of symptoms. For instance, an oculist desires

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[1] In this connection the words of Aristotle with reference to the Ancient Egyptian law, are interesting: "Even in Egypt the physician was allowed to alter the mode of cure which the law prescribed to him, after the fourth day. But if he did so sooner, he acted at his own peril."—*Politics*, Book III, c. 15.

[2] 20 *Col.* 533.

[3] These words (which have been italicized by the present writer) are, though *obiter dictum*, extremely interesting. They suggest this question: Have some practitioners a better right to experiment on human subjects than have others?—a question which, so far as I have been able to ascertain, has never appeared for direct decision in any court of last resort.

[4] 60 Barb. 488. ("Barb." is short for "Barbour." The Barbour reports are certain N. Y. reports which bear the name of their reporter.)

to ascertain whether the injection of certain substances into the anterior chamber of the eye will result in the complete absorption of a senile cataract. Now, senile cataract is by no means a "new" disease, but perhaps older than the human race itself, and, furthermore, for this condition there exists a well-established line of operative treatment. Yet, to forbid the innovator from trying his injection (with or without previous animal experimentation, according to his judgment) would, beyond question, be to hinder the onward march of medicine. Even though the results of the experiment should be unfavorable to the individual, something might very conceivably have been ascertained that would prove immensely serviceable, indirectly at least, in many an after case. Of course, there should be a reasonable chance that the innovation would prove to be an improvement, even for the subject of the experiment himself, over methods long established. Perhaps the *dictum* in the Colorado case with reference to "ordinary" doctors, might help out, should an innovator in the case of an "old" disease, presenting nothing but old and well-known combinations of symptoms, get into legal difficulties by reason of his experimentation.[1]

Other matters coming under the head of negligence, or failure actually to use and employ the reasonable skill and knowledge which the law requires a physician to possess, may thus be stated briefly: A physician is liable for giving improper directions and for failure to give proper ones. He is also liable for failure to call counsel in proper cases. He is just as truly liable for an improper opinion (if damages ensue therefrom) as he is in the case of actual treatment given. He is bound to use pure and proper drugs and aseptic instruments, and to write correct prescriptions. A physician is liable for the malpractice of his partner, though he himself had nothing to do with the case. He is also responsible for the acts of a nurse, if the nurse was acting according to his instructions; and, further, even in other instances, if the nurse was placed in charge of the case by the physician in question who thus by implication warranted her skill and carefulness. A physician is not, however, liable for the acts of a nurse in a public institution in which the physician himself has no direct control over the nurses. A physician is not responsible for the malpractice of a phy-

[1] The leading case on this subject is the Colorado case above mentioned, Jackson v. Burnham. Here the plaintiff had had severe phimosis, and the defendant, instead of slitting up the prepuce, had applied to the penis a flaxseed-meal poultice. Gangrene ensued, together with extensive sloughing, and it became necessary to amputate "his penis wholly from the body." The district court gave judgment to the plaintiff. This judgment was reversed by the Court of Appeals, but sustained by the court of last resort (Supreme Court). Here, however, the innovation was clearly not founded on things already known or on a definite and well-formed theory of benefit to accrue to the subject of the experiment himself.

sician in whose charge he leaves a case, provided the two are in independent practice (i. e., not in partnership) or of a specialist in independent practice to whom the case has been referred by him.

Sometimes the patient himself is negligent, and, under certain circumstances, this "contributory negligence," as it is called, is a complete defense against a claim for malpractice. However, if the acts of the patient did not produce the injury, but merely aggravated it, they are not a complete defense, but may be shown only "in mitigation of damages"—i. e., to diminish the amount of the judgment. An important principle is that, if the injury produced by the patient's negligence cannot be separated from that produced by the negligence of the physician, the patient cannot recover damages.

Some of the commonest forms of contributory negligence consist in (a) failure to follow the physician's directions (b) not giving to the physician full information with respect to the case, (c) the simultaneous employment by the patient or his friends of other treatment in connection with that of the regular physician.[1]

4. The fourth duty of the physician is, in cases of doubt to use his best judgment. This is a difficult rule to understand, because its meaning is indefinite. Nevertheless, the rule exists, and is exceedingly important. The conception is that a physician, though possessed of a reasonable degree of learning and skill and though exercising care in its application, is now and then confronted by peculiar conditions in which he must use his own individual judgment instead of relying on the common stock of knowledge. Whether, in such conditions, it is actually incumbent on the physician to experiment, is a question which, so far as I have been able to ascertain, has never been decided. Probably, should the question arise, it would be decided in the negative. However, it is likely that an actual case or two will do the utmost possible service in the way of making clear this very difficult rule.

In a rather early case, West v. Martin,[2] the defendant was sued for unskilfullness in the setting of the plaintiff's leg. The defendant, among other matters, pleaded "mere error of judgment." But said Ewing, J., in the Supreme Court: ". . . there may be responsi-

[1] A discussion of this matter would lead us into the never-ending realm of medical folklore. I cannot, however, refrain from mentioning a case in which I was much blamed because, after an entropium operation performed by me, erysipelas supervened. On inquiry, I learned from the patient himself that his mother had twice removed the dressings and applied each time for several hours a poultice of warm cow's dung. I also knew of a case where tetanus set in following the application of road mud to a burn. Without doubt, if proper investigation were made in all cases of malpractice, the matter of folk-medicine would assume a more important aspect in connection with the subject of malpractice defence.

[2] 31 *Mo.* 375 (1861).

bility where there is no neglect, if the error of judgment be so gross as to be inconsistent with the use of that degree of skill that it is the duty of every surgeon to bring to the treatment of a case according to the standard indicated."

In Dubois v. Decker,[1] the plaintiff, having a crushed foot, was taken to an almshouse, in which institution, some nine or ten days later, the defendant amputated the leg above the ankle joint. "Six or seven days thereafter, gangrene having set in, he again amputated the leg, this time at the knee-joint. After the second amputation the leg did not properly heal, but became a running sore, and at the time of the trial the bone protruded some three or four inches." The position taken by the plaintiff was that the second amputation had been necessitated, and the deleterious results which followed it had been caused by the delay of nine or ten days in the performance of the first operation. There was expert evidence to show that this was really the case. The defendant alleged "mere error of judgment," stating that he had "waited ten days before operating for the purpose of seeing whether the foot could not be saved, and that a physician and surgeon will not be held liable for mere errors in judgment." But said Justice Haight: ". . . his judgment must be founded upon his intelligence. . . . he should have known the probable consequences that would follow from the crushing of the bones and tissues of the foot."

These two instances serve as well as any that could be selected to show the condition of the law with regard to this very important, yet very indefinite, matter. The cases, unfortunately, relate almost exclusively to the negative side of the question—i. e., as to what does not, rather than to what actually does, constitute the use of one's own best judgment.[2]

Miscellaneous matters.—An interesting question arises with respect to the medical or surgical malpractice of persons not licensed as physicians. A "graduate optician," for instance, employs the title of "doctor" and "eye specialist" and declares to a patient, that he is a practitioner of medicine and that he can cure the patient's affection by means of a pair of spectacles. The patient is suffering from

[1] 130 *N. Y.* 331 (1891).

[2] We might add, as being somewhat relevant to this rule, the legal principle that a physician who does not feel himself competent to treat a given case, should never, for that reason only, rely upon his judgment in that case, for the "judgment" rule has not for its object the protection of incompetency. In all cases where a physician feels himself to be incompetent, his duty is to recommend his patient to employ another doctor, whether specialist or general practitioner. If, however, the patient, after being thus recommended, is willing and desirous that the first physician continue in charge of his case, then the first physician is not liable (as suggested some distance *supra*) for anything but the very grossest negligence.

syphilis of the retina and optic nerve, and in consequence of the negligence of the graduate optician, he fails to receive the proper kind of medical attention, and his sight is destroyed. Is the optician liable? Again, a druggist treats an injured finger, pretending the while to the patient that he is a physician, and damage ensues as a result of the improper treatment. In all such cases the defendant is liable, precisely as if he were really a physician.[1] A still stronger case is that of Nelson v. Harrington[2] in which the defendant was a clairvoyant whose practice it was to place himself in a kind of trance, and, from that coign of vantage, to diagnose and prescribe for his patients. He had never declared himself to be a physician, but, on the contrary, had often asserted that he had no medical knowledge. Nevertheless, the judgment was against him both at the trial and in the higher court.

However, in this connection it is to be noticed that where the therapeutist or the surgeon does not profess to be a physician, and at the same time gives the advice or the service as a friend or neighbor merely, he incurs no liability. The leading case[3] upon this point possesses an especial interest for oculists. The defendant was a midwife, practising in Boston, Mass. She attended the mother of the plaintiff when the plaintiff was born, and, three days later, was shown one of the plaintiff's eyes, which seemed to be inflamed. The defendant declared to the plaintiff's mother that the trouble was "nothing serious, that it resulted from too much light," and she then "directed the witness to darken the room and to dip a linen cloth in water and place it on the child's eye." The room was darkened accordingly, and the application made. Next day the defendant again declared that the trouble was "nothing serious," and that she could cure it, and, this time, she made an application of rose-water. Two days after the first eye presented symptoms of disease, the second eye became affected. However, for two weeks the defendant came in twice daily and applied her washes to the child's eyes. The plaintiff's mother said to the defendant that she was alarmed about the child's eyes, and thought some competent physician should be called in. The defendant, however, replied that she need not be alarmed; that she, the defendant, could cure the disease; that she had cured with her washes several children so afflicted, and mentioned the child of one Mrs. Stevens, whose eyes were much sorer than the plaintiff's, and said she had cured the child's eyes with her washes; that the defendant also told her not to call in a doctor, saying that "the doctors spoiled the eyes of half the children," that "the doctors' washes

[1] Mathei v. Wooley, 69 *Ill. App.* 655.
[2] 72 *Wis.* 591.
[3] Higgins v. McCabe, 126 *Mass.* 13.

would burn the child's eyes out"; that she then told her to send for a fresh egg and have it beaten up with sugar, and wash the child's eyes with that," etc. The result was that the child became totally blind, and there was evidence from regular physicians to show that, had other and more powerful remedies been seasonably employed, they would probably have effected a cure. The court, however, said: "The defendant was originally employed only as a midwife. . . . there was no competent evidence that the treatment of diseases of the eyes which might be developed in the child was embraced in the duties which the defendant undertook as a midwife. . . . A physician must apply the skill and learning which belong to his profession, but a person who, without special qualifications, volunteers to attend the sick, can at most be only required to exercise the skill and diligence usually bestowed by persons of like qualifications, under like circumstances. To hold otherwise would be to charge responsibility in damages upon all who make mistakes in the performance of kindly offices for the sick.[1]

A further miscellaneous matter, and one of much importance, is that, in some states, the defendant in a personal injury suit (to which variety of actions, of course, malpractice suits belong) is wholly devoid of power to oblige the plaintiff to submit to a physical examination for the purpose of determining whether or not his alleged injuries do actually exist, and whether, in case they exist, they are actually of as great extent and severity as the plaintiff has alleged. This would seem to be a very unjust holding, but it is actually the law in Illinois,[2] Texas, Montana, Delaware, Massachusetts, South Carolina, Utah, and also in the courts of the United States. To the contrary, however, hold the courts of Ohio, Kentucky, Georgia, Alabama, Missouri, Kansas, Arkansas, Michigan, Indiana, Wisconsin, Minnesota, Iowa, Washington, California, Colorado, Maryland, Nevada, Oklahoma, and North Dakota. The courts of New York formerly held against the

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[1] This case, however much one's sympathies may go out to the child, is nevertheless undoubtedly good sense as well as good law. One cannot, in fact, help recalling, in this connection, the words of Marshall D. Ewell (*Medical Jurisprudence,* p. 291): "If a patient voluntarily employs in one art a man who openly exercises another, his folly has no claim to indulgence. The old Mahommedan case cited by Puffendorf with approbation is very much to the point: A man who had a disorder in his eyes called on a farrier for a remedy who gave him one commonly used upon his quadrupedal patients. The man lost his sight and brought an action against the farrier for damages, but the judge held that no action would lie, for if the complainant had not himself been an ass he would never have employed a horse-doctor."

[2] I personally know two Illinois physicians (in independent practice) who are considerably out of pocket by reason of the fact that the court which heard their cases refused to compel the plaintiff to submit to an examination of his alleged injuries. The condition of the law on this point ought by all means to be regulated by statute in every State of the Union.

existence of the power, but the decisions of these courts have been overruled by a statute. There are also statutes to the same effect in Florida and New Jersey.

The courts which hold against the existence of the power, assert that the defendant, in case the plaintiff refuses to submit to a physical examination, may still find a sufficient protection against injustice in the privilege which his lawyer possesses of directing the jury's attention to the fact of the plaintiff's refusal. But, on this point, said Beck, J.:[1] "This position is not correct. The defendant is left to depend upon the inference of the jury, which might or might not have been exercised, instead of having the truth disclosed by direct and positive evidence. The law will not require it to depend upon such inference when it can afford the means of producing competent evidence upon the question in issue."[2]

Still another miscellaneous matter relates to the effect which a judgment rendered by a court of law in favor of a physician for his fee, has on the right of the patient, at some later period, to sue the physician for malpractice. It is a well-known fact that not infrequently when a suit is brought by a physician for his fee he is met by a counterclaim for malpractice. Then both matters are litigated together. If the jury decides that the physician has not been guilty of malpractice, then (provided the claim for fees be just and reasonable, not already paid, etc.), the court will give to the physician a judgment for his fees whereas if, on the other hand, the jury holds adversely on the question of the doctor's treatment, then not only does the doctor fail to secure a judgment for his fees, but, generally, he is mulcted in compensatory damages besides. But now suppose the doctor, when he sues for his fees, is not confronted by a claim for malpractice, and that he actually recovers a judgment against the plaintiff for the value of his services, and that, further, at some later date, the patient decides to sue the physician for malpractice. Is the suit for malpractice barred, or is it not?

The answer is that, in the vast majority of jurisdictions, it is, undoubtedly, barred. The great courts of New York, New Jersey, and West Virginia so hold in language clear and unmistakable.[3] Some

[1] In Schroeder v. C. R. I. & P. Ry., 47 *Ia.* 375.

[2] For an extended discussion of this subject see an article by the present writer, entitled "May the Plaintiff in a Personal Injury Suit be Compelled to Exhibit His Injuries? If so, Under What Circumstances?" in the *Michigan Law Review*, Vol. I, Nos. 3 and 4, p. 193 and p. 277, Dec., 1902, and Jan., 1903.

It is interesting to note that the question in hand, though much adjudicated in America, has never arisen for decision in England.

[3] Bellinger v. Craigue, 31 Barb., 534; Gates v. Preston, 41 *N. Y.* 113; Blair v. Bartlett, 75 *N. Y.* 150; Dunham v. Bower, 77 *N. Y.* 76; Ely v. Wilbur, 49 *N. J. L.* 685.

courts make a distinction, however, between cases in which malpractice was actually pleaded as a defense, and those in which a judgment for the fees was taken by default, or where, though the defendant in the suit did actually appear, he nevertheless defended on some other ground than that of malpractice. Such courts hold that, in the latter two contingencies, the suit for malpractice is not barred. However, even in the great majority of states where the question has never as yet arisen in a court of last resort, the decisions of the courts of New York, New Jersey, and West Virginia, would, by reason of the great persuasive authority of these courts, almost certainly be followed.

A final miscellaneous question relating to the American law of malpractice is: May a valid judgment ever be rendered against a physician for malpractice in the total absence of expert testimony against his manner of treatment? The answer is, Yes, in certain very exceptional circumstances (namely where the existence of malpractice is patent to ordinary comprehension) such a judgment in the trial court would most undoubtedly stand. Just what the necessary circumstances are to enable a court to dispense with expert testimony in a malpractice case, is always a question of fact (not of law) but the following are typical and also actual instances of such circumstances, or rather sets of circumstances. In Moratzky v. Wirth,[1] an accoucheur permitted a portion of the placenta, 2 in. long by ⅔ in. in thickness, to remain in the uterus, by which neglect, as was alleged, the plaintiff suffered from septicemia, resulting in the loss of her leg. Held, that expert testimony was not necessary. In Lewis v. Dwinnell,[2] a physician failed to discover, as was alleged, an extensive perineal rupture. Held, that expert testimony could not be dispensed with. In Richardson v. Carbon Hill Coal Co.,[3] a physician who discovered a fracture of the femur 8 inches from the hip joint, did not discover, as was alleged, a coexisting and very manifest dislocation of the hip. Held, that expert testimony was not necessary. And, in Gedney v. Kingsley,[4] a physician, after the reduction of a Colles' fracture, put on the bandages so tightly that, as was alleged, great ulcers formed and the flesh sloughed off. Held, that expert testimony was not necessary. However, in James v. Crockett,[5] when a physician after repeated and careful examinations and a consultation with a competent fellow practitioner, did not discover a dislocation of the arm, it was held that expert testimony could not be dispensed with.

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[1] 67 *Minn.* 46. [2] 84 *Me.* 497. [3] 10 *Wash.* 648.
[4] 16 *N. Y. Supp.* 792. [5] 34 *N. B.* 540.

OPHTHALMIC JURISPRUDENCE

Legal considerations regarding malpractice in England.

The law of medical and surgical malpractice is, in England, very much the same as in America. In England, for instance, a physician (if not under obligations by reason of some official position) is never obliged to accept a case, no matter how great may be the urgency of the call or the importunity of the caller. But, a case once accepted, the doctor is under stringent legal obligations to continue in charge of that case—exactly as in America. In England, too, as in this country, the fact of gratuitous treatment does not alter a physician's responsibility for malpractice, nor is a contract with the patient, or with those who stand to him *in loco parentis*, of the very least validity. Such a contract is, as here, "opposed to public policy and therefore void."

The rule which regulates the *quantum* of skill, however, which a physician is supposed to bring to a case is different, in England, from what it is (or rather they are) in America. In America, as we have seen, there exist three rules: (1) That the physician must use such knowledge and skill as prevail in the particular locality in which he practises. (2) Such knowledge and skill as prevail in such localities generally. (3) Such as are possessed and used by highly educated physicians. The second rule, in America, we saw to be by far the most frequently adopted and enforced. Now, in England, the rule is that a physician must possess and use a "reasonable," or "ordinary," degree of knowledge and skill. Not only in the cases but in the text-books and cyclopedias, the words, "reasonable" and "ordinary" occur with great persistency. Thus, in Jones v. Fay (1865) "Any one who attempts to treat a sick person (otherwise than on sudden emergency) will be liable for any lack of such skill as an ordinary qualified medical practitioner possesses." Again, the *Encyclopedia of the Laws of England*":[1] "A medical practitioner, whether qualified or not, is responsible in a civil action for damages or a criminal prosecution for manslaughter, in case of the lack of reasonable care and skill. In civil actions everything depends on the interpretation of the qualifying word reasonable, and this is for the jury to interpret." The idea of locality, which seems to be the central, the controlling, notion in the American view of medical responsibility, possesses, in English law, absolutely no place whatever.[2] Indeed, in one case, that idea is expressly rejected. Thus, Garrow, B.: "It matters not whether the individual consulted be the President of the College of Physicians or the humblest bone-setter

[1] 1900-09, Vol. IX, p. 125.

[2] Has not the small geographical area of England, together with the large geographical area of the United States, had much to do with the formation of this distinction?

in the village, he ought to bring into the case ordinary skill, care, and diligence."

Lately, however, and unfortunately, there has been developing a tendency on the part of High Court Judges to apply a stricter rule of accountability. This, it seems to me, is a step in the wrong direction undoubtedly, for the proper rule of accountability in a calling in which so much is, from the very nature of things, a matter of individual judgment in the individual case, should be that the practitioner is to be held responsible, not, as in Germany, for the lack of a very high degree of skill, but, as in France, for gross negligence or unskillfulness only. The trouble with the legal view both in England and in America (*a fortiori* in Germany) is that it regards the practice of medicine and surgery as something like, for instance, the industry of cabinet-making. Give to a cabinet-maker the proper materials and the proper tools, and, if he be neither unskillful nor negligent, he will make—and always make —for instance, a proper sort of chair. Then, too, the task of making a given kind of chair, for instance, is always and forever the same, and few, if any, competent workmen, would materially disagree as to how that particular variety of chair should be made. In the practice of medicine and surgery, however, the case is very different. In such a calling, a given variety of task is not always and forever the same. In fact, in such a vocation, the task, one is almost tempted to assert, is never twice alike. To a great extent, therefore, in such an occupation, the workman's individual judgment will always be of necessity engaged, and different workmen will, of course, ever be of very different opinions. Only the great settled governing rules and principles should always be adhered to—asepsis, for instance, and the necessity of ligaturing a large-sized wounded artery—the non-adherence to these, i. e., gross unskillfulness or gross negligence, might very properly be chastized by the courts. This, as said already, is the rule in France, and, again, may we not declare *avec raison* that they do really "order these things better in France?"

To hold a medical man responsible for a high degree of skill, is to insist that he shall, under legal sanction, possess a high degree of judgment. This, of itself, would be bad enough, for rules in the realm of judgment have but little application; but where, as in England and America, that high degree of judgment which is legally required, would have to be submitted to the further judgment of twelve often illiterate men, "assisted" by casual (instead of official) expert witnesses, who are sometimes not even licensed physicians, and concerning whose ability to "assist" in the matter in hand, the jury are about as incompetent to decide as they are of determining for themselves the medical ques-

tions at issue, then the medical defendant simply plays in a law court a game of chance and with the odds decidedly against him at that.

And, in England, even under such circumstances, the jury might, if they saw, or thought that they saw, occasion, assess *punitive*, as well as *compensatory* damages!

In England, as in America, one who poses as a specialist is responsible for a higher degree of skill than is a general practitioner. I have never been able to find on this point any ophthalmic cases, but it is, undoubtedly, the law as to specialism generally.

In England, too, one who copies an erroneous prescription, as, for example, from a text-book, or a journal article, "adopts the error" "and is liable for any resulting injury."

In England, however, a medical man is not liable for disastrous consequences which ensue upon the following of his "mere friendly street-opinion."

Legal considerations regarding malpractice in France.

The question of malpractice in civil cases, is, of course, never submitted to a jury in France, for the simple reason (as stated in the division on courts and basic legal principles) that, in France, there is never a jury in a civil proceeding. Thus, a civil suit for malpractice can be, and as a fact generally is, in France, conducted very quietly, and, in general, if judgment is not delivered against the physician, the public learns but little about the affair. In a common law country, such as ours, this phase of the French expert system could not, of course, be adopted, for, with us, there must assuredly be juries; but a person cannot help reflecting on the manifest justness and fairness of the French method to physicians who have been improperly accused of malpractice.

In France, moreover, as mentioned already, a physician is responsible only for "clumsy mistake," "gross imprudence or negligence," "ignorance of those things which a man of the profession ought surely to understand." In the language of a text-book,[1] "But, as soon as there arises a possibility of discussion as to the value and efficacy of the treatment which has been employed, upon the propriety of an operation which has been performed, as soon, in other words, as it becomes necessary, in order to determine whether or not a physician has been at fault, to trench upon questions exclusively technical and scientific, *when, in a word, the fault does not appear manifestly*,[2] the courts

[1] *Manuel Pratique de Droit Medical*, par Simon-Auteroche, Paris, 1908, p. 186.
[2] The italics do not appear in the original.

recognize of themselves their incompetence in this matter.''[1] Thus it would seem that, in France, a physician is held responsible for malpractice only in that particular class of cases in which, as we have remarked heretofore, an American court delivers a judgment in the total absence of expert testimony.

In France, however, there exists no law providing that a physician's practice in any particular case be tested by the rules and principles of his own school.[2]

Legal considerations regarding malpractice in Germany.

In Germany, as previously remarked, a physician is responsible if he does not exercise ''a high degree of skill,'' ''the skill of a thoroughly educated physician.''[3] The disadvantages and manifest injustice of such a standard of professional excellence have already been adverted to. However, it is only fair to redirect attention to the fact that, in Germany, a civil suit for malpractice is never tried before a jury, and that all the scientific points involved are generally investigated, or at least may be investigated, by a corps of medical experts who, as a rule, are really competent for their task. As a rule, the court-physician (*Kreisarzt*) functionates, and this without respect to the school of practice which the defendant has been following, or professing to follow. The defendant is permitted, however, to summon as experts a number of physicians of his own school, and this is occasionally done by the court on its own motion. As in America, general practitioners are often allowed to testify in matters which involve the skill of spe-

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[1] Owing no doubt to the existence of this rule, malpractice cases are comparatively rare in France. In fact, I have never been able to find so many as a single instance in which the defendant was an oculist. A number of cases of a general nature can be found collected in Briand et Chaudé, *Manuel de Medecine légale,* Paris, 10th ed., Vol. I, p. 73 ff. Several cases (perhaps more accessible) are collected in Dubrac's *Traité de Jurisprudence Médicale et Pharmaceutique,* Paris, 1893.

[2] The scarcity of such rules in Civil Law countries is owing to the fact that, as stated in an earlier portion of this article, in such lands the subject of Evidence does not exist as a well-developed branch of jurisprudence.

[3] The law on this point was, until Jan. 1, 1900, landesgesetzlich (i. e., gov. erned by state law) and hence was different in each of the Bundesstaaten, as is the case in America. On Jan. 1, 1900, however, with the entering into effect of the new ''Civil Code,'' the matter in question passed under the federal law, and, therefore, all the decisions in force (so far as the decisions of courts are possessed of force in Germany) at the present time, are based on the following provision of that code: ''Wer vorsätzlich oder fahrlässig das Leben, den Körper, die Gesundheit, das Eigentum oder ein sonstiges Recht eines anderen widerrechtlich verletzt, ist dem anderen zum Ersatze des daraus entstehenden Schadens verpflichtet. Die gleiche Verpflichtung trifft denjenigen welcher gegen ein den Schutz eines anderen bezweckendes Gesetz verstösst. Ist nach dem Inhalte des Gesetzes ein Verstoss gegen dieses auch ohne Verschulden möglich, so tritt die Ersatzpflicht nur im Falle des Verschuldens ein.''—*Bürgerliches Gesetzbuch,* Sec. 823.

cialists. In fact the Kreisarzt is almost always, as a matter of course, a general practitioner. The right to bring an action for malpractice outlaws (*verjährt*) not until three years.

Another peculiarity of the German law of malpractice (though penal, instead of civil, in its nature) is that a physician is legally required to accept a case, if he is so requested, under certain circumstances, by a police-court or any of its representatives. The exact language of the requirement[1] is as follows: "Whoever in cases of accident or of common danger or necessity is requested by a Police Court or its representatives to afford assistance, and does not comply with the request, although he might so do without material danger to himself, is punishable by a fine not to exceed 150 marks or by imprisonment." This provision of the Penal Code is held to contemplate professional, as well as non-professional assistance. Being a part of the Penal Code, it is, of course, federal in its nature, i. e., nation-wide in its application.

With regard to experimentation, I can do no better than quote from Strassman:[2] "A procedure, merely because it is new and untried, cannot, only for that reason, be rejected as improper. Were such a principle indeed set in force, there could be no further progress in medicine. One can only require that a new and dangerous plan of treatment should be justified in advance of its employment by much consideration and reflection, by anatomical conditions, and by experiment on the lower animals. And one should be all the more ready to accept such a justification, the more obscure and atypical the disease." This opinion is characteristically German, insomuch as it clearly admits the necessity for scientific progress by means at times of human experimentation, and yet, nevertheless, lays down the only just conditions under which the performance of experiments on human beings could be permitted. It is decidedly in contrast to the rather vague, decidedly unscientific, and often wholly unjust requirements to be found in the law of America.

Legal considerations regarding malpractice in Italy.

Physicians in private practice in Italy are not obliged to accept a case either for examination or for treatment, excepting only in cases of great urgency, when immediate (though not subsequent) aid and assistance is absolutely obligatory on the part of every physician.

[1] §360, Ziff. 10, Str.-G.-B.

[2] *Lehrbuch der Gerichtlichen Medizin*, Stuttgart, 1895, S. 545. The high degree of authority conceded to text-books by the German courts has already been adverted to.

Physicians, on the other hand, employed in the official medical sanitary service of the various communes of the Kingdom, are obliged to accept all cases that fall within the scope of their employment. A very extensive and voluminous law[1] has been enacted with regard to these official physicians, regulating their appointments, service, compensation, responsibilities, and participation in the benefits of an elaborate pension system.

A non-official physician, when he has once accepted a case, becomes, of course, responsible for the exercise of diligence and skill while in attendance on such case. His civil liability is regulated not by any special provisions, but by the general laws of the Kingdom, contained in the Civil Code. These laws run as follows:

1151. Any act of a person productive of damage to another, imposes on such person the obligation to indemnify for such damage.

1152. Every person is responsible for the damage he has caused, not only by his act, but also by his negligence or imprudence.

It is, of course, extremely manifest that the law as laid down by article 1151 would, if literally applied, be of so great rigor as absolutely to prohibit the practice of medicine, surgery, and obstetrics in Italy. The courts, however, have, in practice, very much mitigated the severity of the law (as applied to physicians) being, in fact, in this regard, almost, if not quite, as lenient as are the courts of France. Thus, for a single example, the Court of Appeal of Bologna has said that ". . . professional error is pardonable in the liberal pursuits when . . . there is no gross negligence or ignorance of clear rules universally recognized and declared.[2] So also Giorgi:[3] "If *errare humanum est* there exists no field in which this sad truth is more applicable than in the exercise of certain offices or professions, which furnish by their very nature a continued theme for controversy and for doubt. The difficulty of tracing out the elements of fact which should constitute the basis of any expert judgment; the variety of systems and of schools; the occurrence of unexpected events; the vast number of the causes which can influence the result in any case, render excusable any such errors as do not depend on the violation of a clear and certain precept or the neglect of treatment which is evidently necessary."

A very peculiar circumstance connected with the matter in question, is that, in Italy, no civil responsibility ensues till after a criminal

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[1] That of Feb. 25, 1904, entitled *Sanitary Assistance, Hygienic Vigilance, and Hygiene of the Communes of the Kingdom.*

[2] Sent. 2 maggio 1902, Filangieri 1902, 862.

[3] Quoted in the *Enciclopedia Giuridica Italiana,* Vol. X, p. 328.

prosecution has first been brought against the physician and successfully. I know of no such law in any other country.

Another peculiar restriction, if such it may be called, relates to the matter of experimentation. In Italy, in addition to the usual restrictions (preliminary experimentation on the lower animals, some justifiable theory of benefit to accrue to the particular patient who is made the subject of the experiment, etc., etc., as in other countries) it is suggested, in addition, by an eminent Italian legal authority, that the experimenter "before he deduces the innocuousness to man [of the proposed method] from the frog, the rabbit or the dog, ought to have tested the method on himself."[1] This would seem to be a difficult matter indeed to accomplish, in case the experimenter did not happen to possess in his own person a case of the particular malady in question. It would even be extremely difficult for the experimenter to test upon himself the matter of dosage, in case the patient was a child. The restriction might, however, under certain circumstances, very logically be made a condition precedent of the performance of new operations or the administering of new remedies.

In Italy no higher degree of care and skill is legally required of a specialist than of a general practitioner in the same field.

Furthermore, a judgment for malpractice against a physician can be rendered in that country, even in the total absence of expert testimony, provided the existence of malpractice is patent to ordinary apprehension—in other words is not dependent on technical medical or surgical rules and principles.

This completes our discussion of the subject of malpractice with respect to its legal side.[2] We will next take up the

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1 "* * * diversamente il medico risolverebbe i problemi scientifici cimentando la salute e la vita altrui, risparmiando sè stesso, ed allora il malato diventerebbe la bestia da laboratorio, e questa sarebbe seria disonestà professionale." *Enciclopedia Giuridica Italiana,* Vol. X, p. 331.

2 The following extracts from the *Code of Hammurabi, King of Babylon* (about 2250 B. C.) translated by Rob't Francis Harper, Ph. D., would seem to possess especial interest for oculists, because without doubt they constitute the oldest extant legislation concerning ophthalmology:

"196—If a man destroy the eye of another man, they shall destroy his eye.

"198—If one destroy the eye of a freeman or break the bone of a freeman, he shall pay one mana of silver.

"199—If one destroy the eye of a man's slave or break a bone of a man's slave, he shall pay one-half his price.

"215—If a physician * * * open an abscess (in the eye) of a man with a bronze lancet and save that man's eye, he shall receive ten shekels of silver (as his fee).

"216—If he be a freeman, he shall receive five shekels.

"218—If a physician * * * open an abscess (in the eye) of a man with a bronze lancet and destroy the man's eye, they shall cut off his fingers.

"220—If he open an abscess (in his eye) with a bronze lancet, and destroy his eye, he shall pay silver to the extent of one-half of his price."

B—Medical and Surgical Considerations Regarding Malpractice.

Under this head will be narrated typical and otherwise interesting cases of ophthalmic malpractice which have been the subject of suits either actual or contemplated. Excluded, however, will be all cases which have undergone decision in courts of last resort, for the reason that the most important of such cases have already been discussed under "Considerations Legal."

The largest proportion of all the suits and claims for malpractice that ever confront the ophthalmic surgeon arise from strabismus operations.[1] The reason is obvious. The strabismic eye is almost always defective in its vision to begin with, and, if the oculist does not observe the precaution to explain and even to demonstrate absolutely beyond cavil the fact of defective vision in each particular case in which he is about to operate, then, after the operation, when the patient, or his relatives for him, are curious about the exact results, the undesirable fact of complete or partial blindness comes out, and the surgeon is blamed for the defective condition of the sight. Already, under the heading of "Considerations Legal," we have seen that several cases of malpractice suits following strabismus operations have even reached the courts of last resort. Here is another instance. An oculist of the highest standing (scientifically at least) did a double internal advancement for a girl of eleven years. He had made a record of the case but had failed to set down the vision of either eye, nor had he directed the parents' attention to the fact that the vision in both of the eyes was decidedly defective. No doubt the operation was correctly performed, but the immediate effect was undeniably an over-correction of six or eight degrees. This instigated the parents of the child to do considerable investigating into the condition of the eyes on their own account (in which proceeding they were ably assisted by a graduate optician) and at last they arrived at the conclusion that the distinguished oculist had ruined the eyes of their child. They then set up a claim for damages against the operator, who, very properly, refused to pay. In search of expert evidence they returned to two eye specialists (practising independently of each other) by whom the child had been examined before they had taken her to the man by whom the operation had been performed. Each of these oculists had, happily, made a complete record of the case, including, of course, the vision of

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For the rest of this remarkable code, see The Code of *Hammurabi, King of Babylon,* by Rob't Francis Harper, Ph. D., 2d ed., 1904, Chicago, Callaghan & Co.

[1] So at least according to a collection which I made for many years of newspaper and medical journal clippings which related to malpractice suits, as well as also according to many notes which I made of various cases that either fell within my personal experience or came to my ears by reliable report.

each eye, and very soon the parents were convinced that their claim for damages was unfounded. A laughable feature of the affair was that, when their child had been taken to the last of the three oculists (that one who had done the operation) and by him been examined, he had expressed (after the fashion of some men otherwise sufficiently worthy) several very decidedly unflattering views of the professional attainments and judgment of the two oculists who had been consulted before him. Afterwards, taxed with these ungracious opinions, he, though contritely enough, admitted that he had made them.

I have also known of other instances in which the defective sight of a crossing eye has given rise to malpractice suits, or claims, because, as in the case narrated, the surgeon had neglected, before the operation, to impress the patient, or those responsible for him, with the actual condition of his sight.

Deep retraction of the caruncle after a strabismus operation has been, in one instance, the ground for a claim for malpractice. The operation had been performed by a traveling charlatan who was one of the few of his class that I have ever known to be made the subject of a claim, or suit, of this sort.

Next to strabismus operations, as a fertile field for the growing of malpractice suits, come the various foreign-body cases; foreign bodies in the cornea, foreign bodies in the aqueous, foreign bodies in the iris or the lens, foreign bodies in the vitreous, and, finally, foreign bodies in the posterior wall of the eye and even in the orbital fat. Foreign bodies in the cornea, not infrequently (and even after the most aseptic removal) leave infection of that membrane with consequent ulceration and all the deplorable sequelæ. In such cases, just because the offending substance was perhaps extremely minute, the patient jumps to the conclusion that no such serious consequences would, or could, have followed, had not the treatment been improper.

Small, hard bodies flying with great velocity sometimes perforate the cornea, and then, if the patient is working in comparative darkness, as often happens in the case of miners, the pupil is, of course, rather widely dilated and the tiny projectile will lodge perhaps in the periphery of the lens, and, later, when the surgeon examines the eye, as he usually does, with a very strong light, he contracts the pupil and prevents himself from seeing the offending substance. I was told of a case in which an eye was lost, or was said to have been lost, in this very manner, and which formed the ground for a successful claim for damages.

I had personal knowledge of a case which formed the ground of a claim for damages in which a piece of steel was supposed to have

entered an eye very deeply. The attending oculist suggested that the eye be submitted to the X-ray for the purpose, of course, of deciding whether or not there was a foreign body present, and, further, if present, its precise location. The patient, however, refused to have the skiagraph made, first, because of what she regarded as "the very great expense which such a proceeding would necessitate"; and second, because she had heard of people being injured by the action of the Roentgen ray. At the time when the case appeared before the oculist, there was not to be seen a breach of surface anywhere, nor even a trace of any former breach. The aqueous was dark with blood, and so an ophthalmoscopic examination was impossible. The surgeon combatted the inflammation for several days, and then the patient sought another oculist. The second practitioner, after several days of treatment, discovered, whether by skill or by a lucky chance, the offending substance, and removed it with a magnet. Unfortunately, this second oculist permitted to escape him certain remarks which reflected on the skill, or judgment, of the first practitioner, and the result was a claim for damages. The patient brought with her to the first physician's office, her two main witnesses, but these, fortunately for his reputation, refused to stand by the claimant's allegations. The result was that no suit was ever brought.

Ophthalmia neonatorum, too, presents its quota of claims for damages against the attending physician, and, strangely enough, the disgusting and discreditable character of the disease does not suffice in every instance to keep the claim out of court. I know of a case in which a general practitioner was sued for allowing the disease to occur without the slightest effort to prevent it. He had known at the time of delivery that the mother had recently suffered from gonorrhea, and, in fact, himself had treated her for that disease up almost to the very day of labor. The doctor was given an opportunity to settle for a small sum, and, very wisely, he accepted the opportunity.

Glaucoma, strangely enough, considering the frequency with which the disease is mistaken, and treated for iritis and conjunctivitis, has seldom been the subject of a suit for malpractice. I know, however, of two cases. One was where a family physician had treated a case of this disease for a very short time by means of atropin and adrenalin, with the result that the patient was very nearly blind, when, with considerable indignation, she left him for an oculist. This oculist, though he smoothed the matter over for the family practitioner, nevertheless recommended, as was no doubt his duty, an immediate iridectomy in both eyes. But the operation was indignantly refused. The patient called again on her family practitioner, who strongly stayed her up in

her contention that an operation was entirely unnecessary, and who also bade her seek the services of another oculist. The second specialist, being a man of careless speech, said something which aroused the patient's suspicion, and the result was a claim for damages against the family practitioner. The matter was somehow settled.

The second case was where a family practitioner mistaking (as has so often happened, sometimes without the practitioner's fault) glaucoma for iritis, dispatched his patient to a pharmacy with a prescription calling for cocain with atropin. The result was blindness for the patient, and a suit for the doctor. The prescription was on record, and the fact of absolute glaucoma indisputable. The claim was settled out of court by the payment of a small sun.

An oculist of excellent reputation and undoubted ability, being rushed with work, performed a pterygium operation without sufficient consideration of all the factors in the case. It so happened that the patient had dacryocystitis on the same side as that on which the operation was performed, and the result was a panophthalmitis. A claim followed, which, in some way, was settled out of court.

Now and then a cataract operation gives rise to a suit. I was told by a friend, an oculist, that, after a simple extraction performed by him, he was sued because the operated eye had recovered only half its vision. The doctor, a man of much ability and the very greatest caution, knowing exactly what his rights were, would not scare at all, and the suit was abandoned.

I know of an oculist who had a case of trachoma in the cicatricial stage, complicated with pannus and numerous corneal ulcers. The patient made an excellent recovery, so at least the oculist thought, but the patient thought differently, or at least professed to do so, and made a claim for damages. The oculist refused to pay the claim, and the patient sued, alleging total blindness. Not long after, and before the case had arisen for trial, the plaintiff fell from a tree in which he was picking cherries, and sustained a fracture of the occipital bone. Shortly afterward he died.

Another illustrative case was this: A miner was struck in the eye by a piece of flying coal. That the injury was severe was shown by the great contusion of the lids and the formation, subsequently, of a deep and angry ulcer on the cornea. In order to cure the ulcer it became necessary to perform a paracentesis of the anterior chamber, and this procedure was carried out with the very greatest caution. The patient got well, and had absolutely perfect vision—for a time at least. In the course of a few weeks, however, a traumatic cataract appeared, and for this the operation was supposed to be to blame. On being informed,

however, that the blow inflicted by the coal was itself entirely responsible for this late manifestation, the miner, an exceptionally reasonable man, was altogether satisfied.[1]

Even refraction work is not devoid of the malpractice danger. I had a clipping of a case which related that an oculist, a man of merit and means, had been subjected to a suit because an optician had informed the plaintiff (and afterwards been sustained in his contention by an educated oculist) that one of his eyes had suffered an extensive detachment of the retina because of a badly fitting lens. In another case, a claim was made against a meritorious oculist because, as was alleged, a badly-fitting pair of lenses had produced a pterygium and "granulated" eyelids. Here is still another case connected with refraction work. A lady, aged 20, complained of headache and rapid ocular fatigue. Test-lenses and ophthalmoscope declared the refraction normal. Into each eye was instilled thrice daily for three days a 1 per cent. solution of atropin. Then the test-lenses and ophthalmoscope revealed four dioptres of hypermetropia. Glasses were prescribed, and she suffered no longer from headaches or from ocular fatigue. Nevertheless, she evinced intense dissatisfaction because, her ciliary muscles being now relaxed—as, of course, they ought to be—she was, as she alleged, without her glasses "blind." She admitted that, with her lenses, she saw as well as anyone, and had neither headache nor ocular fatigue, but all this very evident improvement was as dust and ashes beside the over-whelming and heart-rending fact that, without her glasses she was "blind." All the proffered explanations made by the oculist were unheeded, and, indeed, appearances, however unjustly, were much against the doctor. Legal proceedings were discussed, and it was only through the influence of the general practitioner who had referred the case to the specialist, and who, by the way, was a relative of the plaintiff, that legal action was averted.

I have the record of a number of other cases, but these are not especially illustrative. However, I cannot leave this subject without a bit of moralizing—for which, I trust, the great importance of the sub-

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[1] Here it may not be amiss to state that the possibility of the formation of a late traumatic cataract should always be explained to patients suffering from ophthalmic trauma, both when the case is taken and again when the patient is discharged. The time consumed is well invested, nor need the patient be affrighted unduly by such an advance explanation, for the matter can be represented (as, in fact, it ought to be) as merely the remotest possibility; and then, should the unexpected happen, the physician is safe.

It is a rather suggestive fact, at least from the doctor's viewpoint, that the number of malpractice suits which a physician is liable to encounter, stands in a direct ratio to his ability to make a judgment "good." In other words, such suits seem to bear relation of some sort to the doctor's financial ability rather than his scientific inability.

ject involved will provide a sufficient excuse. It will have been observed, in nearly all the cases just narrated, that the real, the fundamental, the underlying cause of the suit, or at least of the claim, for damages, was (either by intent or otherwise) another doctor. This fact should give us pause. There is also another fact to be observed in nearly all these cases which constitutes a ground for very serious consideration. And that is this: The defendant in nearly every instance, was an unusually competent man. I must really dissent from an opinion quite recently expressed by an able lawyer in an American surgical system,[1] which runs thus: "On the other hand, the earnest, diligent, well-read, scientific surgeon, who has a library and reads his journals, who uses instruments of precision, who observes approved methods; the 'good,' 'reliable' surgeon, who knows how to reduce dislocations, adjust fractures, tie arteries and treat wounds, to supervise the use of anesthetics, and to prescribe or conduct the after treatment, who, after a careful examination, uses his best judgment and skill in operating, who is exacting as to prior assent, and who instructs nurse and patient as to conduct, while not immune, has little to dread in the courts." This, no doubt, is the strictly legal (also, perhaps, the strictly public and general) view of the matter. But doctors, to whom the subject of medical and surgical merit and demerit is not a sealed, but an open book, are perfectly aware that there could hardly exist a greater mistake than that expressed in the opinion above-quoted. Quacks, as a mere matter of absolute truth, are very seldom sued. On the other hand, the greatest surgeons in the country, subject as they are to continual jealousy, and receiving, as they do, many of the hardest and most inveterate cases, as well as a very high proportion of the most dangerous, are almost continually "in hot water." An excellent ophthalmic surgeon of my acquaintance has been sued, or threatened with suit, no less than seventeen times. And, though no judgment was ever rendered against him, the worry has hurt him and aged him vastly more than all his work. Moreover, in nearly every instance the cause of his trouble was either the malice or the thoughtlessness of a fellow practitioner. The surgeon I have in mind was probably not really to blame in any single instance. And equally good men have not been quite so fortunate as he in the outcome of their suits. All this sad state of affairs with regard to medical and surgical malpractice could easily be different. In the first place, the French standard of responsibility should be adopted everywhere. The physician should be held accountable only for violations of clearly estab-

[1] Hampton L. Carson, in Keen's *Surgery*, 1909, Vol. V, p. 1180.

lished principles—in a word, for gross negligence or gross lack of skill. Furthermore, expert evidence, in all these cases, should be really expert. Then, too—and this perhaps is the most important matter—every physician who examines a patient that has been to another doctor, should be cautious in every word that he utters. Or, rather, he should be more than merely negatively cautious, he should be positively kind. He should do, in short, exactly as he would be done by. If every physician would only observe this rule—the golden rule in a professional aspect—he would never discover an occasion to regret it, whether he practised in America, in England, in Germany, France, or Italy, or, indeed, in the remotest portions of the earth.

With regard to the jurisdiction of United States courts in negligence cases, I am greatly indebted to a private letter from Judge A. L. Sanborn, federal judge for the Western District of Wisconsin.

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